Transportation and Economic Development

Consultation II
“A Vision of the Future”

Organized by the
University of South Dakota - Governmental Research Bureau
Vermillion, SD
and the
Hubert H. Humphrey Institute of Public Affairs
Minneapolis, MN
South Dakota Transportation and Economic Development Consultation II

July 10, 1992

Session Evaluation

Please circle the appropriate responses for each question:

1. Was the purpose of the session clear?
   - No  
   - Somewhat  
   - Very
   1  2  3  4  5

2. Did the session achieve its purpose?
   - No  
   - Somewhat  
   - Very
   1  2  3  4  5

3. How valuable were the Welcome and Opening Remarks?
   - No  
   - Somewhat  
   - Very
   1  2  3  4  5

4. How valuable was the presentation Movement of Goods: Technological Advances, Infrastructure, and Operations by Denver Tolliver?
   - No  
   - Somewhat  
   - Very
   1  2  3  4  5

5. How valuable was the presentation New Life for Regionalism? The Once and Future Transportation Plan by Allan Wallis?
   - No  
   - Somewhat  
   - Very
   1  2  3  4  5

6. How valuable was the Small Group Discussion lead by the group facilitators?
   - No  
   - Somewhat  
   - Very
   1  2  3  4  5

7. How valuable was the Large Group Discussion?
   - No  
   - Somewhat  
   - Very
   1  2  3  4  5
8. How valuable was the Q & A Forum?
   No  Somewhat  Very
   1    2      3  4   5

9. How valuable was the Quality Check and Wrap Up?
   No  Somewhat  Very
   1    2      3  4   5

10. Were you satisfied with the facility and arrangements?
    No  Somewhat  Very
    1    2      3  4   5

11. I am employed by:
    _____ Business
    _____ Government
    _____ Education
    _____ Other (describe) ____________________________

12. What did you like best about this session, and why?

13. What would you change about today's session, and why?

14. Other comments or reactions?

Thank you for your comments
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TRANSPORTATION, ECONOMIC DEVELOPMENT CONFERENCE JULY 10 IN PIERRE

VERMILLION -- Placing South Dakota and the region in a better position to compete in the global economy is the focus of a July 10 transportation conference at the Ramkota Inn in Pierre.

Sponsored by the University of South Dakota Governmental Research Bureau and the Hubert Humphrey Institute of Public Affairs at the University of Minnesota, "Consultation II: Transportation and Economic Development in the Upper Midwest" will begin at 9:50 a.m. on Friday, July 10.

Consultation II will examine economic development opportunities under the Intermodal Transportation Efficiency Act of 1991 (ISTEA). It is the second transportation conference sponsored by USD's Governmental Research Bureau and the Hubert Humphrey Institute of Public Affairs. The first conference was held this spring in Sioux Falls.

After opening remarks, Denver Tolliver of the Upper Great Plains Transportation Institute at Fargo, N.D., will address "Movement of Goods: Technical Advances, Infrastructure, and Operations" at 10 a.m.

Dr. Allan Wallis, director of research for the National Civic League, will keynote the transportation conference at 10:30 a.m. with "New Life for Regionalism? The Once and Future Transportation

--more--
Plan." Wallis is an assistant professor of public policy at the Graduate School of Public Affairs at the University of Colorado at Denver.

Following lunch, small group discussions will be hosted by USD facilitators Michael Card and Barry Bram, and Tamara Trussell of Sioux Falls. Large group discussions on options, alternatives and problems and small group findings will begin at 2:30 p.m.

The conference will conclude with a question and answer forum to be hosted by Ben Orsbon, chief planner of the South Dakota Department of Transportation, and Ken Eschmeyer, planner for the Federal Highway Administration.

For more information contact: Steve Feimer, USD Governmental Research Bureau, (605) 677-5703.

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South Dakota Transportation and Economic Development

Blueprint for Success: Intergovernmental Cooperation, Strategic Planning, and a Commitment to the Action Plan

South Dakota Consultation II

July 10, 1992
Ramkota Inn
Pierre, South Dakota

Sponsored by the
University of South Dakota - Governmental Research Bureau
Vermillion, South Dakota
(605) 677-5702
and the
Hubert H. Humphrey Institute of Public Affairs
Minneapolis, Minnesota

Agenda
South Dakota Consultation II

Moderator: James McKeon - Executive Director, Pierre Area Chamber of Commerce

9:30am  Complimentary Continental Breakfast & Registration

9:50  Welcome and Opening Remarks
Richard Howard, Secretary
South Dakota Department of Transportation

10:00  Investment in Transportation
Dr. Denver Tollefson
Upper Great Plains Transportation Institute
North Dakota State University - Fargo

10:30  Keynote Speaker - Dr. Allan Wallis
New Life for Regionalism? The Once and Future Transportation Plan.
Director of Research, National Civic League
University of Colorado - Denver

11:15  Luncheon Provided

12:00pm  Small Group Discussion
Group Facilitators
Michael Card - University of South Dakota
Barry Bram - University of South Dakota
Tamara Trussell - Sioux Falls

2:15  Break

2:30  Large Group Reconvenes
Options, Alternatives, and Problems
Findings from the small groups
Forum allowing for Questions & Answers
Ben Orsbon - Chief Planner, SD Department of Transportation
Ken Eschmeyer - Planner, Federal Highway Administration

3:45  Quality Check and Wrap-Up
Biographical Sketches of Speakers

Denver Tolliver
Research Scientist, Upper Great Plains Transportation Institute
North Dakota State University - Fargo

Denver Tolliver is a research scientist at the Upper Great Plains Transportation Institute, North Dakota State University, where he has been employed since February of 1980. Denver's primary research specializations are: freight transportation, railroad economics and costing, and multimodal planning. He is currently involved in the development of an interdisciplinary graduate transportation degree program at North Dakota State University, scheduled to begin in the spring of 1993.

Prior to his appointment at NDSU, Denver was a rail planner for the ND Department of Transportation, where he developed North Dakota's rail benefit-cost model and helped develop their first state rail plan. While he was a rail planner for the ND Department of Transportation he also developed a branch line viability and cost procedure, and analyzed the impacts of restructuring the Milwaukee Road.

Denver holds a PhD from the Virginia Polytechnic Institute, where he majored in Environmental Design & Planning and minored in Transportation. Denver's dissertation was on the impacts of grain subterminals on rural highways.

Allan Wallis
Director of Research, National Civic League
University of Colorado - Denver

Allan Wallis is a member of the faculty of the Graduate School of Public Affairs at the University of Colorado in Denver, where he teaches courses in urban policy, growth management, and innovation in state and local government. He is also director of research for the National Civic League. His work there includes a study of emerging forms of regional governance in the United States.

Before moving to Colorado, Dr. Wallis was senior research associate at the Taubman Center for State and Local Government at Harvard University's Kennedy School of Government. His work there included several studies on infrastructure policy, particularly private rail initiatives.

Dr. Wallis is a frequent contributor to The Public's Capital, a quarterly newsletter on infrastructure issues which is now published as part of Governing magazine. He also edits the section on regional governance in the National Civic Review.

Among his recent publications are: The New Denver International Airport: A Case Study of Large-Scale Infrastructure Development which appears in the latest issue of the Municipal Finance Journal; and New Life for Regionalism: Maybe? which appeared in the Spring issue of the National Civic Review. Writing on a somewhat different aspect of transportation, Dr. Wallis authored Wheel Estate: The Rise and Decline of Mobile Homes, published by Oxford University Press in 1991.
Public Finance

The passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in December 1991 create new opportunities for state and local governments, as well as creates significant new financing challenges. The act shifts responsibility for planning and setting transportation priorities from the federal government to states and regional bodies, while setting standards for certain areas such as safety at the federal level. The very title of the act predicts a new way of doing business in the area of transportation, with a new focus on surface transportation, intermodal planning and efficiency.

While intergovernmental cooperation in planning and setting transportation priorities is encouraged by the new act, such cooperation is frequently incidental rather than systematic. It is more common for states and local jurisdictions to compete with each other for limited funds than to cooperate in developing the best and most efficient transportation solutions.

While ISTEA authorizes increased funds for transportation infrastructure for the next six years, there is no guarantee that these funds will in fact be appropriated. With the federal deficit as large as it is, Congress and the President will be hard-pressed to fully fund the transportation authorization while cutting spending in other areas or increasing taxes. Even if all of the funding is appropriated, citizen and business demands for infrastructure improvements and maintenance go well beyond available funds.

What is the solution? States must begin a long-term process to redesign and restructure their systems of planning and setting transportation priorities. The types of shifts that need to occur can be grouped into four major areas:

**Current System**

Modal autonomy in planning, priorities and funding

Jurisdictional focus, dedicated funding, fixed formulas

Emphasis on funding capital improvements maintenance and operating costs

Limited linkage between who benefits and who pays

**Alternative Model**

Intermodal, customer oriented approach in setting funding priorities

Regional, cooperative model with increased flexibility

Emphasis on long-term costs and benefits of transportation improvements

Greater use of pricing and benefit assessment

**Modal Autonomy vs. Intermodal Approach**

**Current system:** Until the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA), public funding of transportation systems in the U.S. was handled differently for each mode of transportation. The planning and setting of priorities with each mode relied on a separate federal funding stream, working within the framework of a separate federal authority (Federal Highway Administration, Federal Transit Administration, Federal Railroad Administration, etc.) As Figure 1 shows, Minnesota's transportation financing is representative of most states, with a heavy bias towards funding highways.
Even though most state departments of transportation have incorporated the other modes within their missions, highway funding and planning has tended to dominate their work. The 1956 Federal-Aid Highway Act and the Highway Revenue Act enhanced the emphasis on highway transportation by establishing the Federal Highway Trust Fund and by authorizing the completion of the Interstate system. The 1978 and 1980 deregulation of the airline and railway industries has further complicated intermodal transportation planning and funding decisions.

Table 1 indicates federal transportation infrastructure priorities.

**Alternative model:** While ISTEA encourages an intermodal approach to planning, prioritization and funding transportation systems, states have just begun to think about how their organizations and systems should change to become intermodal. If intermodal is to become more than a buzzword, it will require redefining planning systems to consider all modes in the planning process. An initial step may be to create an intermodal team, as the Minnesota Department of Transportation has done. However, eventually each of the components of the system for planning and setting priorities should be organized on an intermodal basis. This may mean examining and redefining processes that have been in place for many years. Moving towards a more integrated intermodal transportation system will require more public and private financing ventures.
<table>
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<th>Priorities for Increased Annual Federal Infrastructure Spending</th>
<th>1999 Federal Spending* (in billions of dollars)</th>
<th>Priorities</th>
<th>20 percent increase in Spending* (in billions of dollars)</th>
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<tr>
<td>Surface transportation total</td>
<td>$17.9</td>
<td>Maintain and improve condition of existing facilities.</td>
<td>$21.5</td>
</tr>
<tr>
<td>Highways and bridges</td>
<td>13.8</td>
<td>Expand system capacity through implementation of existing traffic management techniques. HOV and smaller lanes, signalization, and automated toll facilities. R&amp;D on advanced technologies, e.g., intelligent vehicle/highway systems. Improve intermodal connections.</td>
<td></td>
</tr>
<tr>
<td>Mass transit</td>
<td>3.5</td>
<td>Expand transportation system capacity and efficiency by adding tranways and improving intermodal connections, stations, terminals, and parking facilities. Modernize equipment and rehabilitate rails.</td>
<td></td>
</tr>
<tr>
<td>Rail (passenger)</td>
<td>0.6</td>
<td>Modernize capital equipment. Implement high-speed rail in overcrowded corridors.</td>
<td></td>
</tr>
<tr>
<td>Airports and airways total</td>
<td>8.6</td>
<td>Complete National Airspace System Plan. Expand system capacity through other advanced surveillance, guidance, and communications technologies. Expand system capacity with airport and runway construction. Improve intermodal connections.</td>
<td></td>
</tr>
<tr>
<td>Ports and waterways total</td>
<td>1.0</td>
<td>Continue to maintain and rehabilitate existing facilities. Expand capacity on a selective basis. Improve landside (intermodal) connections. Address environmental issues.</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25.5</td>
<td></td>
<td>30.6</td>
</tr>
</tbody>
</table>

*Federal spending totals include some noninfrastructure expenditures, such as for safety.

A 20 percent increase is hypothetical. However, for surface transportation, it approximates the impact of spending the current Highway Trust Fund balance over a 5-year period.

Jurisdictional Focus vs. Regional Cooperation

Current system. Over the years, the system of funding highways has had a strong jurisdictional focus. Transportation funding is dedicated by federal law and state constitutions. Each jurisdiction — state, county, city — receives an allocation of highway funds under fixed formulas. Most highways are included in the Federal-Aid System and are eligible for federal aid. The Federal-Aid System is divided into four divisions: the Interstate System, the Federal-Aid Primary System, the Federal Urban System and the Federal-Aid Secondary System. State systems also include trunk, county, municipal and town road and bridge accounts.

User charges comprise the largest source of tax revenue for highway financing. User fees include: motor-fuel taxes, registration fees, motor vehicle excise taxes, driver license fees, and weight-distance taxes. A comparison of user fees and total revenue is shown in Figure 2. Nationally, 60% of all highway revenues were generated by user taxes in 1989. The Minnesota Highway User Tax Distribution Fund derives funding from a twenty cent gasoline tax, vehicle registration fees, and motor vehicle sales taxes. Ninety-five percent of this fund is allocated to: the Trunk Highway Fund (62.0%), the County-State Aid Highway Fund (29.0%), and the Municipal-State Aid Street Fund (9.0%) (Figure 3). Other states use similar formulas. General funds, property taxes, and local bonds are also used to finance capital outlays, maintenance and operations of highways and roads (Figure 4).

**Figure 2**

[Graph showing user taxes as a percentage of total current revenue]

User-taxes as Percentage of Total Current Revenues for Highways.
All Levels of Government, 1987

Figure 3

Figure 4

TRANSPORTATION FUNDS MANAGED BY MNDOT
FY 1990 Unaudited - $Millions
Source: Minnesota Department of Transportation

While constitutionally allocated trust funds may provide predictability and stability to the system, they can also limit expenditure decisions. Currently, there is little opportunity for a jurisdiction to consider the opportunity cost, or alternative uses of these funds. Also, since each jurisdiction has its own sources of money, there is no particular incentive to cooperate with other jurisdictions in transportation planning.

States also allocate their own funding for transportation and have mandates for state level planning. Yet there is little incentive for regional or cooperative transportation between states. The emerging competition for north/south trade corridors is generating some new cooperative efforts between states, but this is more the exception than the rule.

Alternative Model. States should consider placing greater authority for planning, setting priorities and making transportation funding decisions at regional level within and among states. The federal government should encourage long-term joint transportation planning between states. This should occur both on a multi-state regional basis and between each state and its neighbors. Federal funds should be allocated to pay for these multi-state planning efforts, and the federal government should consider giving higher priority to funding multi-state transportation plans over single-state priorities.

ISTEA may force the greater participation of Regional Development Commissions, Metropolitan Planning Organizations and provides the foundation for interstate cooperation in transportation planning.

Capital Improvements vs. Maintenance

Current system. The current system of transportation funding encourages capital improvements over maintenance and operating costs. By law federal funding is restricted to capital improvements; therefore, highway operations and maintenance is left largely to the states and local governments (Table 2 & Figure 5). In 1989, state and local governments financed over half of all highway capital improvements. Maintenance of deteriorating infrastructure has become an increasingly important issue for state DOTs. The question is whether the current system offers too much of an incentive to build new roads and not enough encouragement to take into account the long-term costs of supporting this infrastructure.
Trade and Commerce

Do Transportation Investments Pay Off in Economic Growth?

Most researchers agree that, in general, investments in infrastructure should mirror rates of economic growth. That is, infrastructure investments should follow rather than lead economic development. These researchers also prove that infrastructure supports economic activity and that continued decline in this type of investment will eventually erode our productivity, competitiveness and quality of life. Strategic investments in transportation infrastructure include those that make the system more efficient by reducing the costs of getting people and products to their destinations. This may mean building or improving roads in areas that connect with major trade routes, transport major export commodities, help to reduce congestion, or improve access between various modes of transportation.

In 1965, Niles Hansen, a University of Texas economist classified regions into three categories: congested, lagging and intermediate. This typology may help to show how investments in infrastructure can pay off. A congested community benefits from infrastructure investments by reducing the time wasted on choked highways – this helps to accommodate the growth experienced by these faster growing areas. A lagging community is one in which employment and industry are declining, little benefit comes from increased infrastructure investments in such areas. Intermediate areas are those which lack specific infrastructure improvements but have a trained workforce and prospects of future economic growth.

The Basics of the Upper Midwest's Economy

The five states of the Upper Midwest, including Minnesota, Iowa, North Dakota, South Dakota and Montana, are centrally located just west of the St. Croix and Upper Mississippi rivers and south of the Canadian border with Manitoba, Saskatchewan and Alberta. This region shares a history of trade and commerce based on agricultural production and trade. This agricultural base led to the development of the Twin Cities of Minneapolis - St. Paul as a financial services center and distribution hub for much of the region’s value-added agricultural and manufactured products.

In keeping with its agricultural and natural resource-based economy, the region is relatively sparsely populated. Between 1960 and 1985, the population of the Upper Midwest grew at a rate well below the national average (see CURA Trade Centers study3). Within the Upper Midwest, there continues to be growth of urban centers and loss of population in rural communities.

### Upper Midwest Population

<table>
<thead>
<tr>
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<tr>
<td>Iowa</td>
<td>2,943,000</td>
<td>57%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>4,324,000</td>
<td>35%</td>
</tr>
<tr>
<td>North Dakota</td>
<td>660,000</td>
<td>63%</td>
</tr>
<tr>
<td>South Dakota</td>
<td>715,000</td>
<td>72%</td>
</tr>
<tr>
<td>Montana</td>
<td>805,000</td>
<td>65%</td>
</tr>
<tr>
<td>U.S.</td>
<td>248,239,000</td>
<td>19%</td>
</tr>
</tbody>
</table>

Source: Almanac of 50 States
Agriculture is very important to the region. Iowa is second in the nation for agricultural exports, South Dakota leads the U.S. production of oats and rye and is second in sunflower seeds and flaxseed. Minnesota is ranked first in sugar beet production, third in soybeans and fifth in corn production. The region is also strong in numerous livestock products. The producers of these agricultural products continue to consolidate — during the past 30 years the number of farms and farmers has decreased by 37 percent.

Natural resource based activities such as mining, energy resources and tourism are also important to the region’s economy. During the past two decades there has been rapidly accelerating development of fossil fuels in the Western Dakotas and Montana and increasing tourism development in Montana and Minnesota.

Over the past several decades these states’ economies have experienced a great deal of change. For the states of Minnesota and Iowa this has meant a tremendous diversification and continued growth of the economic base. For the Dakotas, the past twenty years have led to loss of population and economic activity overall. Montana continues to reap benefits from its natural resources of minerals, forestry and wilderness (tourism) as well as a small but vital manufacturing sector. The service sector has grown over the past decade both nationally and in the region. At the same time, many manufacturing sectors have lost employment.

The most striking change in employment in the Upper Midwest has been the growth in service industries, particularly those servicing the business and the computer industry. This has been the case in high population density states like Minnesota as well as low-density states such as North Dakota.

### Upper Midwest Employment by Industry Percent Change 1979 - 1989

<table>
<thead>
<tr>
<th>Industry</th>
<th>Iowa</th>
<th>Minnesota</th>
<th>N. Dakota</th>
<th>S. Dakota</th>
<th>Montana</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>44.31</td>
<td>60.68</td>
<td>23.27</td>
<td>28.07</td>
<td>38.59</td>
<td>73.09</td>
</tr>
<tr>
<td>Mining</td>
<td>-29.92</td>
<td>-60.15</td>
<td>17.73</td>
<td>-23.12</td>
<td>-33.35</td>
<td>-25.09</td>
</tr>
<tr>
<td>Construction</td>
<td>-28.17</td>
<td>-12.01</td>
<td>3.64</td>
<td>17.66</td>
<td>-19.74</td>
<td>-9.27</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-11.92</td>
<td>1.60</td>
<td>13.80</td>
<td>3.60</td>
<td>7.06</td>
<td>17.68</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>-10.36</td>
<td>14.88</td>
<td>-11.89</td>
<td>-4.45</td>
<td>-11.42</td>
<td>18.65</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>8.24</td>
<td>19.18</td>
<td>5.18</td>
<td>7.56</td>
<td>-0.91</td>
<td>27.64</td>
</tr>
<tr>
<td>Fin., Ins. &amp; R. Est.</td>
<td>19.12</td>
<td>30.34</td>
<td>-77.24</td>
<td>39.84</td>
<td>-4.45</td>
<td>31.82</td>
</tr>
<tr>
<td>Services</td>
<td>39.75</td>
<td>51.97</td>
<td>43.92</td>
<td>41.95</td>
<td>31.66</td>
<td>62.98</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6.72</td>
<td>20.35</td>
<td>12.22</td>
<td>16.28</td>
<td>1.39</td>
<td>22.70</td>
</tr>
</tbody>
</table>

Source: U.S. Census, County Business Patterns
Trade: The Engine of Economic Growth

The goods producing activities of the region, including manufacturing, construction, farming, agricultural services, forestry, fisheries and mining, are a measure of the region’s economic growth potential. These goods are exported outside the region and bring additional income to the area. According to the Bureau of Economic Analysis data on income from employment in these industries, only two states in the region, Minnesota and Iowa, exceed the national rates of goods producing income.

Foreign trade is a part of this export income. In the five states these exports are as follows:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>2,189</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Minnesota</td>
<td>5,091</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>North Dakota</td>
<td>360</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>South Dakota</td>
<td>205</td>
<td>49</td>
<td>45</td>
</tr>
<tr>
<td>Montana</td>
<td>229</td>
<td>48</td>
<td>44</td>
</tr>
</tbody>
</table>

The ability to produce and deliver goods to trading partners is an essential part of a healthy economy. In the Upper Midwest, goods produced are shipped to other regions of the U.S. and to foreign destinations. The following table shows the importance of foreign exports to the economy of these five states.

<table>
<thead>
<tr>
<th>State</th>
<th>Foreign Exports as Percent of Gross State Product, 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>4.2</td>
</tr>
<tr>
<td>Minnesota</td>
<td>5.4</td>
</tr>
<tr>
<td>North Dakota</td>
<td>1.7</td>
</tr>
<tr>
<td>South Dakota</td>
<td>3.2</td>
</tr>
<tr>
<td>Montana</td>
<td>1.8</td>
</tr>
<tr>
<td>U.S. (as a pct. of GNP)</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Source: Survey of Current Business

Increasing globalization of the world's economy, along with "freeing" up of trade restrictions among North American neighbors places the Upper Midwest in a unique position to capture a greater share of the increasing north-south trade with Canada and Mexico. According to one recent study, the Red River Trade Corridor between Upper Midwest and Manitoba is the fourth largest corridor along the Canadian border, accounting for nearly $8 billion in trade annually. These commodity flows include energy, wood and paper products, chemicals and agricultural products flowing south from Canada and industrial equipment, electronics, motor vehicles and parts, consumer goods and agricultural products flowing north. As this level of trade increases, it will require more attention to the connectivity between this region and other destinations throughout the U.S. on a north-south axis.
Getting Our Products to Market

Minnesota is a pole for much of the economic activity of the region. Minneapolis - St. Paul is one of 28 airline hubs nationally. Of these hubs, Minneapolis – St. Paul airport ranks 16th in aircraft departures and 12th in freight shipments per 10,000 residents. Several of the region’s intermodal (rail/truck, rail/barge) hubs are located in Minnesota (e.g. Twin Cities, Dilworth, International Falls, Duluth/Superior). According to University of Minnesota economist, Wilbur Maki, the Twin Cities serves as the core metropolitan area of the multi-state commodity-producing region and as a part of the global transportation - communications network.

The Upper Midwest’s trade and commerce depends heavily on its transportation infrastructure. The region has a number of well maintained interstate and highway thoroughfares which carry passenger vehicles within and through the region. In addition, to motor vehicles, passengers rely on the air services available at major commercial air hubs such as the MSP airport as well as other commercial and private aviation centers throughout the region. The vital service sector and headquarters functions of the Twin Cities rely heavily on the existence of the Minneapolis - St. Paul airport and its daily access to major markets throughout the world.

### Passenger and Air Freight in Upper Midwest, 1989

<table>
<thead>
<tr>
<th></th>
<th>Passenger Enplanements</th>
<th>Freight Enplanements (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>1,042,003</td>
<td>7,816</td>
</tr>
<tr>
<td>Minnesota</td>
<td>8,871,085</td>
<td>65,765</td>
</tr>
<tr>
<td>North Dakota</td>
<td>500,561</td>
<td>3,077</td>
</tr>
<tr>
<td>South Dakota</td>
<td>350,015</td>
<td>1,645</td>
</tr>
<tr>
<td>Montana</td>
<td>678,614</td>
<td>9,109</td>
</tr>
</tbody>
</table>

Source: FAA Statistical Handbook

Annual aircraft operations are projected to increase dramatically, showing an increase of 75% from 2.1 million to 3.9 million over the next thirty years. This is due to an envisioned increase in the amount that each aircraft is used especially as aircraft are used to a greater extent for business purposes.

Goods produced in the region rely primarily on shipments by trucks along the extensive interstate and intrastate highway system of the region. The following table shows the modes by which the region shipped its manufactured freight in 1989. Trucking is clearly the dominant force in the region. This varies somewhat by commodity. Grains and coal shipments are carried by the region’s rail system and some barge traffic. Air cargo accounts for high value computers and scientific instruments as well as printed matter.
Inbound and Outbound Manufactured Freight, 1989  
(millions of tons)

<table>
<thead>
<tr>
<th>State</th>
<th>Total</th>
<th>Truck</th>
<th>Rail</th>
<th>Air</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>94.2</td>
<td>74.0</td>
<td>17.0</td>
<td>.020</td>
<td>3.2</td>
</tr>
<tr>
<td>Minnesota</td>
<td>126.9</td>
<td>103.7</td>
<td>18.3</td>
<td>.076</td>
<td>4.8</td>
</tr>
<tr>
<td>North Dakota</td>
<td>14.8</td>
<td>11.3</td>
<td>3.5</td>
<td>.045</td>
<td>0.0</td>
</tr>
<tr>
<td>South Dakota</td>
<td>14.6</td>
<td>13.3</td>
<td>1.3</td>
<td>.001</td>
<td>0.0</td>
</tr>
<tr>
<td>Montana</td>
<td>35.7</td>
<td>30.1</td>
<td>5.6</td>
<td>.017</td>
<td>0.0</td>
</tr>
</tbody>
</table>

TOTAL
Upper Midwest | 286.2 | 232.4 | 45.7 | 0.159 | 8.0 |
Percent of Total | 100.0 | 81.2 | 16.0 | 0.0 | 2.8 |

Source: American Trucking Associations Foundation/Reebie Associates

According to the ATA Foundation, 77 percent of the total freight moved throughout the Midwest is transported by midwestern trucking companies.

While water does not account for as large a share of total shipments as other modes, it is important to point out that the total shipments by barge through the Rock Island District of the Mississippi River grew nearly 90 percent from 1979 to 1989, and was dominated by grain and coal.

Miles of Public Roads and Streets

<table>
<thead>
<tr>
<th>State</th>
<th>Total</th>
<th>Urban</th>
<th>Rural</th>
<th>Federal Aid Primary Highway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>112,551</td>
<td>7,843</td>
<td>94,425</td>
<td>9,566</td>
</tr>
<tr>
<td>Minnesota</td>
<td>129,553</td>
<td>12,912</td>
<td>115,458</td>
<td>10,206</td>
</tr>
<tr>
<td>Montana</td>
<td>71,360</td>
<td>2,113</td>
<td>69,092</td>
<td>6,644</td>
</tr>
<tr>
<td>N. Dakota</td>
<td>86,384</td>
<td>1,600</td>
<td>84,579</td>
<td>6,109</td>
</tr>
<tr>
<td>S. Dakota</td>
<td>73,378</td>
<td>1,574</td>
<td>71,622</td>
<td>6,674</td>
</tr>
</tbody>
</table>

Source: FHWA

Levels of Public and Private Investment

Investment in infrastructure has slowed during the past several decades. Capital outlays for infrastructure are 1.6 percent of the gross national product today compared to 2.2 percent in 1963. Investments in infrastructure come from both public and private sectors. Public sector sources include federal, state, and local governments. During the past ten years, the burden of building and maintaining our transportation infrastructure has been shifted to the state and local level. These needed investments must now compete with an increasing array of other public goods in an environment of reduced taxing capacity.
The American Commission on Intergovernmental Relations (ACIR) produces a measure of tax capacity based on property values, sales tax and mineral production for each state as well as tax effort — the burden placed on the states' revenue base relative to the national average. The following summarizes these for the Upper Midwest region.

State Fiscal Summary

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>$15,487</td>
<td>84</td>
<td>118</td>
<td>20</td>
</tr>
<tr>
<td>Minnesota</td>
<td>$17,657</td>
<td>103</td>
<td>117</td>
<td>20</td>
</tr>
<tr>
<td>North Dakota</td>
<td>$13,563</td>
<td>85</td>
<td>107</td>
<td>17</td>
</tr>
<tr>
<td>South Dakota</td>
<td>$13,685</td>
<td>78</td>
<td>95</td>
<td>18</td>
</tr>
<tr>
<td>Montana</td>
<td>$14,078</td>
<td>84</td>
<td>102</td>
<td>20</td>
</tr>
</tbody>
</table>

U.S.            | 100                    | 100                  |                    |                   |

Source: American Commission on Intergovernmental Relations.

The private sector invests in infrastructure mainly in plant and equipment. Private sector investments related to transportation include fleets of motor vehicles, material handling equipment, warehouses as well as computerized inventory and communications equipment. In an era of "just-in-time" delivery of parts and materials to U.S. manufacturers transportation is substituting for warehousing. This makes the speed and reliability of the transportation system even more crucial for the competitiveness of American manufacturers.

The following table shows the ratios of total public capital stock to total private capital for this region in two years, 1978 and 1988, derived by the Federal Reserve Bank of Boston from BEA data. This study (see Munnell, 1990) concluded that public capital investment has a statistically significant positive impact on private sector output. It also showed that although this public capital investment enhances productivity, public capital substitutes for private capital — the more public investment available the less private investment is required. It also proved a significant positive impact between investment in public capital and employment growth.

Ratio of Public Capital Stock to Private Capital Stock

<table>
<thead>
<tr>
<th>Year</th>
<th>Iowa</th>
<th>Minnesota</th>
<th>Montana</th>
<th>N. Dakota</th>
<th>S. Dakota</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>1: 2.8</td>
<td>1: 2.0</td>
<td>1: 3.3</td>
<td>1: 3.8</td>
<td>1: 2.3</td>
</tr>
<tr>
<td>1988</td>
<td>1: 2.5</td>
<td>1: 2.2</td>
<td>1: 3.1</td>
<td>1: 4.2</td>
<td>1: 2.2</td>
</tr>
</tbody>
</table>

Source: Federal Reserve Bank of Boston
New Models for Cooperation in Infrastructure Development

Deregulation:

The Motor Carrier Act of 1980 relaxed the restrictions governing interstate movement of goods. This Act led to a dramatic increase in the number of road transport carriers and intermediaries. Between 1979 and 1985 the number nearly doubled. As a result, a hub and spoke network for less than truckload (LTL) emerged to take advantage of the economies of scale of consolidating shipments.

Most analysts believe that deregulation led to a relative fall in prices, and contrary to some fears service to rural areas has not deteriorated. The most significant impact of deregulation has been the greater competition between modes as trucks are now competitive with rail even on long hauls. While this competition has in many ways been beneficial, it has also made planning for an intermodal transportation system very difficult due to the entrenched interests of competing modes.

- Minnesota recently adopted a new law regulating the intrastate trucking operations. This law allows for greater competition in transporting of less than truckload (LTL) shipments.

- Border crossings with Canada managed jointly. Montana Governor, Stan Stephens recently led a trade delegation to Alberta, Canada that worked to create a jointly operated vehicle inspection station at the border at Coutts, Alberta. In addition the Montana/Alberta Advisory Committee has been given increased emphasis to help expand the trade, cultural and intergovernmental ties between Canada and Montana.

Intermodalism:

A recent University of Minnesota study of use of intermodal shipping found that Intermodal Railroad-Truck (IRT) is used by a great variety of industries. The most common characteristic of users of IRT was that their shipments tended to be low-volume per unit of size and had a distant destination. The benefits of IRT include reduced energy consumption, pollution, congestion, and road deterioration. Promoting greater use of IRT is limited by present regulatory structure.

- Siting of new intermodal truck/rail yards is difficult. The City of Minneapolis is planning to development such a new facility, working with industry to improve inner-city goods movement and reduce delays in through shipments.

Public-Private Finance

The Pennsylvania Partnership Act: provided for more formal partnership arrangements between the public and private sector, and permits municipalities to act jointly with each other and with the private sector to finance transportation projects. The act provides a process for pooling resources to take advantage of economies of scale. It also establishes transportation development districts which may raise revenues through: 1) imposing an assessment on business property or benefitting projects, 2) imposing any other taxes permitted by law, 3) issuing notes and bonds, and 4) accepting grants, gifts and donations. Finally, this act requires that the transportation development districts establish multi-year transportation improvement programs that identify priorities.
Interjurisdictional Cooperation

With the increasing potential for new markets brought forth by the trade agreement with Canada and the potential for a trade agreement with Mexico, the major goods shipment axis will shift from its traditional east-west orientation to a north-south one. (Larry Swanson of the University of Montana has analyzed the trade flows between U.S. and Canada.) The Red River Trade Corridor has organized a coalition of business institutions and governmental institutions including Minnesota, North Dakota, and Manitoba to promote trade within the corridor. A similar effort is being undertaken by several western states.

South Carolina’s State Development Board has initiated the use of GIS (Geographical Information Systems) to better coordinate infrastructure investments and other community and economic development activities. The GIS system allows policymakers to consider large geographical based data related to policy analysis and industrial site selection. GIS systems have the potential to connect transportation infrastructure investments with other infrastructure needs such as water and wastewater systems, and with broader economic development objectives. This GIS program has been a joint effort of several state agencies including the Highway Department, the Department of Health and Environmental Control, and the Water Resources commission.
Role of Technology in Transportation

The advent of new technologies in transportation has enhanced the economic growth of the Upper Midwest. New technologies will continue to be part of the development of the region's transportation system. A variety of areas can be used to highlight the changes technology will bring to this region. These apply to all modes of transportation. The following graphic represents possible changes in surface transportation.7

![Diagram of Intelligent Vehicle Highway System]

Basic Components of an Intelligent Vehicle Highway System (Source: U.S. Department of Transportation National Transportation Strategic Planning Study - March 1990)

This paper looks at both current and future technology innovations now being considered by various transportation venues. The Upper Midwest and other regions of the country are also exploring such opportunities. The most advanced technology being tested in the region is Intelligent Vehicle Highway Systems (IVHS). This paper highlights its passenger and commercial vehicle applications.

Great gains have been achieved in recent years by using additional technology information systems for aviation traffic management. Today's advances in transportation technologies are centered around surface transportation. In each of the states of the region, research projects are being conducted by the state Departments of Transportation and by universities. In some cases, private enterprise such as Motorola, 3M and other companies are involved in these projects. The region must be ready to evaluate and test various modes of this technology during the next five years.
Throughout the region, agriculture serves as a key ingredient to economic prosperity. Transportation of agricultural products as well as other products is essential to the economic growth of the region. The use of new technologies, such as on-line systems between shippers and carriers, can keep costs competitive by creating faster and more efficient delivery systems.

In addition, new technologies may increase the productivity of transportation vendors and government regulators. Several research projects are testing more efficient monitoring of government regulatory requirements. In addition, training for future employees of transportation related industries might be aided by satellite based education systems.

The five state region will be able to serve as a model for regional cooperation in technology implementation.

Current Technologies Being Implemented in the Five State Region

IVHS

Minnesota is one of the nation’s leading research centers of Intelligent Vehicle - Highway Systems (IVHS). Minnesota Guidestar is the state’s IVHS program and is a joint effort between the Minnesota Department of Transportation and the University of Minnesota’s Center for Transportation Studies.

Minnesota Guidestar plans to reduce traffic congestion and improve safety. By decreasing delays, air quality will be improved and energy will be conserved.
Research is focused on three primary areas: 1) attempting to prevent congestion and predicting where and when it will occur 2) providing motorists with in-vehicle information on a variety of topics, including congestion, weather conditions and routing advice 3) developing fleet dispatching services for taxis, busses and emergency vehicles.

<table>
<thead>
<tr>
<th>General Public</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuters</td>
<td>Travel</td>
</tr>
<tr>
<td>Shoppers</td>
<td>Decreased travel time</td>
</tr>
<tr>
<td>Public transportation users</td>
<td>Increased safety</td>
</tr>
<tr>
<td>Tourists</td>
<td>Increased comfort and convenience</td>
</tr>
<tr>
<td></td>
<td>Increased security</td>
</tr>
<tr>
<td></td>
<td>Decreased cost</td>
</tr>
<tr>
<td></td>
<td>Economic</td>
</tr>
<tr>
<td></td>
<td>Increased productivity</td>
</tr>
<tr>
<td></td>
<td>improved international competitiveness</td>
</tr>
<tr>
<td></td>
<td>Product innovation</td>
</tr>
<tr>
<td></td>
<td>On-time delivery</td>
</tr>
<tr>
<td>Private Sector Operators</td>
<td>Environmental</td>
</tr>
<tr>
<td>Trucking companies</td>
<td>Decreased air pollution</td>
</tr>
<tr>
<td>Bus companies</td>
<td>Decreased noise pollution</td>
</tr>
<tr>
<td>Taxi</td>
<td>Increased fuel savings</td>
</tr>
<tr>
<td>Small package delivery</td>
<td></td>
</tr>
<tr>
<td>Emergency services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information</td>
</tr>
<tr>
<td>Industry</td>
<td>Increased trip efficiency</td>
</tr>
<tr>
<td>Automotive manufacturers</td>
<td>More uniform and effective traffic enforcement</td>
</tr>
<tr>
<td>Electronics manufacturers</td>
<td>Improved trip planning</td>
</tr>
<tr>
<td>Traffic systems suppliers</td>
<td></td>
</tr>
<tr>
<td>Researchers</td>
<td></td>
</tr>
<tr>
<td>Public Sector Operators</td>
<td></td>
</tr>
<tr>
<td>State DOTs</td>
<td></td>
</tr>
<tr>
<td>Traffic departments</td>
<td></td>
</tr>
<tr>
<td>Transit agencies</td>
<td></td>
</tr>
</tbody>
</table>

**IVHS Beneficiaries (Source: Mobility 2000)**

**IVHS-CVO**

There is a great deal of interest in commercial applications of IVHS at the federal level. Currently, the Federal Highway Administration is funding research of regional strategies for IVHS-CVO. Several studies are being done across the country, investigating how states can cooperate with each other.

Researchers in Iowa and Montana are investigating applications of Intelligent Vehicle - Highway Systems (IVHS) in Commercial Vehicle Operations (CVO). The Iowa research is being conducted by the Midwest Transportation Center(MTC) and the Montana investigation is being done in cooperation with the Washington State Transportation Center (TRAC).

According to Mark Hallenback, Director of the Washington State Transportation Center, there is an eight state project in the Northwest, another eight state project in the Southeast, and a third project with three states in the Southwest.

The regional projects are designed to "encourage and assist regional states and industry in adopting advanced IVHS technologies which can increase the productivity and safety of motor carriers and efficiency of state regulatory programs."
There are two broad goals of the FHWA sponsored research:

- Free Flow of Interstate Truck Movement
- Electronic Commercial Driver/Vehicle Safety Inspections

The first goal hopes to create "transparent borders." Using electronic technologies to coordinate states' regulatory systems would allow commercial vehicles to travel from one state to another easily and smoothly. Compliance with registrations, licenses and permits would be verified electronically by a regulatory agency. Further, mileage could be reported to the states electronically."

Researchers at the MTC in Iowa are leaders of the IVHS-CVO applications field. They have identified five promising applications for IVHS-CVO.9

- Weigh-in-motion with automatic vehicle identification
- Pre-clearance for safety inspection
- "One-Stop-Shopping" for licenses, registrations, and permits
- Automated, apportioned fuel tax administration using instrumented state line crossings
- Automatic toll collection using electronic toll and traffic management systems

Researchers at MTC estimate complying with states' regulations and permit requirements cost $12,000 per tractor-trailer per year. This does not include the cost of taxes, tolls and fees associated with registration requirements. Assuming "that the Iowa's motor carriers surveyed are indicative of motor carriers throughout the country, a conservative estimate of the national cost of complying with administrative rule and regulation is approximately $6 billion per year."10

MTC says there is a need for a new paradigm for the successful application of IVHS-CVO application. More work "on institutional and policy issues is needed in terms of research, within the motor carrier community, and among policy-makers and there staffs."11

**Telecommunications and Distance Education**

North Dakota has several education programs reliant on telecommunications technology. The Upper Great Plains Transportation Institute is developing a two-way interactive satellite system.12

The system will link up four universities and six Departments of Transportation. The satellite system, expected to be operational by the end of September 1992, is designed to accomplish three objectives:

- Establish a graduate program in transportation at the four universities to be linked, North Dakota State University, University of Wyoming at Laramie, Utah State-Logan, Colorado State-Fort Collins.
- Stimulate technology transfer and research awareness between the universities and the DOT's.
- Create discussion between the DOT's in areas of policy and technical expertise.

The University of North Dakota-Grand Forks is developing a satellite based education program which will broadcast aviation instruction to universities across the United States.13 UND has received $4.5 million from the FAA to develop the system and it expects to receive additional FAA funding. The FAA hopes the service will provide more consistent aviation instruction.
The satellite education program will provide aviation instruction to ten universities by September 1992. Eventually, this service is expected to serve between forty and fifty universities.

UND has recently acquired a Cray supercomputer which will develop better models to predict weather conditions. The university will use the computer to research weather conditions as they relate to transportation challenges, such as de-icing of planes.

UND is also providing computer based instruction for students training to be pilots. Gone is the old manual based education. Students studying hydraulic systems are now able to see the operation of the systems in motion on their computer screens.

![Evolutionary Architecture](image)

**Pave-Tech**

"Pave-Tech" is being used by the North Dakota Department of Transportation. "Pave-Tech" uses a mini-van equipped with cameras to inventory the condition of North Dakota state highways. This technology improves the state's pavement management system, providing a more consistent inventory of state highway conditions.

Before "Pave-Tech," twenty-four ND-DOT workers spent three months investigating the conditions of state highways (equivalent of eight full-time workers).

Now, with the use of the $130,000 mini-van, three DOT workers do the work that the twenty-four did previously. Once the ND-DOT is finished cataloguing its roads and highways, it plans to lease out the mini-van to cities and counties.
Regional Technology Projects

Nine projects are being tested throughout the nation in conjunction with the Federal Highway Administration. Several of these projects have multi-city and multi-state parameters.

The following graph shows the location of these projects.

![Map of selected operational tests being conducted with Federal funding participation.]

A brief synopsis of the work of these projects is as follows:

**TRANSCOM:** A consortium of 14 transportation and public safety agencies in the New York and New Jersey area which are working to improve inter-agency responses to traffic incidents.

**SMART Corridor Project:** A joint demonstration project located along 12.3 miles of Santa Monica Freeway corridor in Los Angeles. The objective is to provide congestion relief through various alternatives.

**Guidestar Project:** A cooperative effort that will bring together a number of on-going operational traffic management and traveler information systems with a range of IVHS projects in Minnesota.

**Pathfinder Project:** A cooperative effort by Caltrans, FHWA and General Motors to provide in-vehicle navigation to improve traffic flow.

**TravTek:** TravTek represents a public/private partnership involving the City of Orlando, Florida, the Florida DOT, FHWA, General Motors, and the American Automobile Association (AAA) to
provide traffic congestion information and various guidance facilities to 100 test vehicles equipped with an in-vehicle TravTek device.

ADVANCE: An effort to evaluate performance of the first large-scale dynamic route guidance system in the nation in a joint project including the Illinois DOT, Motorola, Inc., the Illinois University Consortium and the FHWA.

DIRECT: Located in the Detroit, Michigan area, it will deploy and evaluate four alternative low cost methods of communicating advisory information to motorists.

HELP/Crescent: HELP (Heavy Vehicle Electronic License Plate Program) is a multi-state, multinational research effort to design and test an integrated heavy vehicle monitoring system.

Advantage I-75: The project represents a partnership of public and private sector interests along the I-75 corridor to allow transponder equipped and documented trucks to travel any segment along the length of I-75 at mainline speeds with minimal interruption at weigh/inspection stations.

Possible Projects for Five State Region

The following is a list of possible cooperative efforts between the states within the region.

- Duplicate I-75 project possibly along I-94 and I-29.
- Expand GuideStar focus into five state region; broaden to include rural applications of IVHS.
- Expand current Iowa project for truck licensing and regulating into five state consortium.
- Provide linkages for radio or transponder information amongst properly equipped vehicles in five state region.
- Duplicate HELP/Crescent Project for heavy vehicle monitoring.

The possibilities for developing a five state consortium project are limited by the funds and the equipment available. However, as this information demonstrates, a need exists in the nation to determine how this work would be implemented into larger scale designs.
Endnotes

1. Leading work on this topic includes:

Aschauer, David Alan. 1991 "The Third Deficit" GAO Journal pp. 4-8;

Forkenbrock, David J., Thomas Pogue, Norman S. J. Foster and David J. Finnegan 1990 Road Investment to Foster Local Economic Development Iowa City: Public Policy Center;

Munnell, Alicia H., Editor. 1990 Is There a Shortfall in Public Capital Investment? Boston: Federal Reserve Bank;


6. Sources for the Environment, Safety and Quality of Life section are as follows:


Brandt, Steve. 1988. Light rail may be wrong cure/Study finds flaws in assumptions that led to push for system in Hennepin. Star Tribune. March 21: 1A.


7. All maps and graphics in this paper are from *An Overview of the IVHS Program Through FY 1992*, Federal Highway Administration, Washington, D.C.

8. IVHS Funding for Institutional Issues Development Memorandum, FHWA, 5/21/92.

10. MTC report.

11. MTC report.

12. Interview with Gene Griffin, Director of Upper Great Plains Transportation Institute, 5/20/92.

13. Interview with Scott Bergstrom, Director of Technology Based Instruction Research Laboratory, 5/21/92.


NOTES
Q & A*

Please refer to glossary for a description of abbreviations used throughout this section.

Q: Under Section 1028 (f), can the BIA distribute the 1% funds it receives from one State to another State? Put another way, can a State receive more than its 1% funds back if the BIA determines their needs to be greater?

A: The 1 percent of Title 23, Section 144 funds available for bridge projects on Indian Reservation Roads (IRR) in a specific State may only be obligated for those bridge projects on IRR in that State. Any of these IRR bridge allocations in excess of the IRR bridge needs in a State will be returned to that State for use as apportioned bridge program funds for bridge projects on other than IRR.

Q: What transportation projects and programs are eligible for CMAQ program funds?

A: Program funds are only available if the projects meet certain criteria spelled out in the ISTEA. In determining project eligibility under these criteria, priority should be given to implementing those projects and programs that have documented emissions reductions associated with them, and are included in an approved State Implementation Plan (SIP) as a transportation control measure (TCM). The Environmental Protection Agency (EPA) and DOT have agreed that the following meet the criteria and may be funded without project-level air quality analysis and further consultation with the EPA:

1. Transportation activities in approved SIP.
2. The TCMs included in Section 108 (b) (1) (A) of the CAAA of 1990.
3. Construction of bicycle and pedestrian facilities, nonconstruction projects related to safe bicycle use, and State bicycle/pedestrian coordinator positions, as established in the ISTEA, for promoting and facilitating the increased use of nonmotorized modes of transportation. This includes public education, promotional, and safety programs for using such facilities. Details on such positions will be discussed in a separate memorandum.

Q: Assume a State has spent all its old Federal-aid secondary funds and wants to rebuild a bridge or road on what was the old Federal-aid secondary system. The bridge or road would now be eligible for STP funding. Would the bridge or road also be eligible for ER funding following a declared disaster?
A: Based on the present wording in 23 U.S.C. 125(b), for all eligible disasters or catastrophic events that occur after passage of the ISTEA, the ER program is limited to repair of highway facilities on the NHS (including Interstate) only. Assuming in this question that the disaster occurred after passage of the ISTEA, a bridge on the old secondary system would not be eligible for ER funding.

Q: Can new traffic signals be constructed using IM funds on frontage/cross roads where previous signals did not exist (Traffic signal project)? If an IM reconstruction project is proposed, can IM funds be used for new traffic signals if none existed before (assuming warrants are met)?

A: New traffic signals (where none previously existed) may be installed with IM funds at ramp terminals, cross roads, frontage roads, et., within the normal Interstate participation limits, provided that the signals are an incidental part of a larger project for the reconstruction of Interstate interchanges or over crossings. Projects for new signal installations without attendant reconstruction of the cross road or interchange should be funded with other funds.

Q: How will project cost overruns due to major change orders, etc., be handled/coded on projects where original source of funding, i.e. primary, is exhausted? Should overrun, for example, be charged to NHS or STP funds? What appropriation code should be used for overrun? What Pro Rata should be used for overrun—75%...80%? Should project be set-up as if it were a split-funded job?

A: Project cost overruns must comply with the original agreement provision, although other sources of funds may be used if the original source is exhausted. Therefore, NHS funds may be used to cover the overrun but at the original Federal share. The NHS appropriation code would be used for the overrun. Note that if new work is authorized with istea funds, even on the original project, a different Federal share may be established.

Q: Section 1024 of the ISTEA includes several references to approvals by the Governor (e.g., MPO designation, metropolitan boundaries, TIPs) but the Interim Metropolitan Planning Guidance in discussing these actions only says or "the governor's designee" when referring to TIP approval. Can the Governor delegate other approval actions to a designee as allowed prior to the ISTEA?

A: Consistent with past practice instituted with the 1973 legislation that established the requirement for designation of MPOs by the State, the Governor may designate an individual to act on his/her behalf in all instances cited in Section 1024 where action by the Governor is necessary.
Q: How will the funding be allocated for projects that are located in more than one State?

A: For multi-State projects we have requested that the involved FHWA field offices work with the States to see if agreement can be reached on a split for FY '92 funds. After the field advises us of the results of these discussions, we will then allocate the funds based on the split the States have agreed to. Also funds for both multi-State "construction" and multi-State "feasibility studies" projects will be split based on State input.
General Guidance on ISTEA
Metropolitan Planning Requirements

The purpose of this document is to provide interim guidance to the FHWA and FTA field offices on addressing the ISTEA metropolitan planning requirements pending the issuance of formal guidance through the rulemaking process. The guidance is intended to clarify and emphasize the statutory requirements that must be met and to provide target dates by which the MPOs and States will be expected to comply with the various provisions. In a few cases, suggestions on how to meet certain requirements in a more flexible and/or simplified manner are provided, e.g.: 

- Preliminary views on use of abbreviated procedures in certain non-transportation management areas that are not non-attainment for ozone or carbon monoxide.

- Suggestions for simplified project selection procedures once the TIP has been developed in accordance with the ISTEA requirements, i.e., prioritized, financially reasonable, and approved by both the MPO and the Governor.

In the case of the requirement for development of a congestion management system (CMS) in TMA's, the guidance addresses phase 1 of the phase-in schedule the Secretary is required to provide. In phase 1, the existing urban transportation planning process in conjunction with the EPA process can constitute an interim CMS if certain criteria are met. In TMA's that are also non-attainment areas for ozone and/or carbon monoxide, this would provide a mechanism to determine whether single occupant vehicles projects will be in compliance with the CMS requirement.

DESIGNATION OF MPOS IN NEW URBANIZED AREAS (UZAS)

PROVISION--For each UZA over 50,000 population, a MPO must be designated by agreement between the Governor and local units of government representing 75% of affected population (in the metropolitan area) including the central cities or cities as defined by the Bureau of the Census, or in accordance with procedures established by applicable state or local law. (23 USC 134 (b)/FTA-Sec 8 (b) (1))

GUIDANCE--These requirements should be followed in designation MPOs for UZAs. States and local officials involved in new UZAs designated as a result of the 1990 Census should initiate discussions on the designation of MPOs as soon as possible. MPOs will need to be designated in time to develop and approve a TIP by 10/1/92.

PROVISION--More than one MPO can be designated within an urbanized area only if the Governor determines that the size and complexity of the urbanized area make designation of more than one MPO appropriate. (23 USC 134 (b) (6)/FTA-Sec 8 (b) (6)).

GUIDANCE--We do not expect this to be the case in new urbanized areas.
PROVISION--Existing MPO designation remain valid until a new MPO is redesignated unless revoked by the Governor and local units of government representing 75% of the affected population under State of local procedures. The new MPO must be designated by agreement between affected population (in the metropolitan area) including the central cities or cities as defined by the Bureau of the Census. (23 USC 134(b) (4) & (5) (A)/FTA-Sec 8 (b) (4) & (5) (A)).

GUIDANCE--If the Governor and local officials decide to designate a new MPO but do not formally revoke the existing MPO designation, the existing MPO remains in effect until a new MPO is formally designated.

COORDINATION BETWEEN MPOS AND STATES

PROVISION--If more than one MPO has authority in a metropolitan area or an area which is designated as nonattainment for ozone or carbon monoxide, the MPOs must consult with each other and the STATE(s) in the coordination of plans and programs. (23 USC 134 (e)/FTA-Sec 8 (e)).

GUIDANCE--In those areas where this provision is applicable, coordination efforts should be initiated and the results documented in subsequent transmittals of plans and programs to the State, FHWA, and FTA.

PLANNING PROCESS

PROVISION--The Act lists 15 factors that must be considered as part of the planning process for all metropolitan areas. (23 USC 134 (f)/FTA-Sec 8 (f)).

GUIDANCE--MPOs in cooperation with the States and transit operators should begin reviewing their existing planning processes to see if these factors are being adequately considered, and where necessary, modify their processes to consider any factors that are not currently being adequately considered. The consideration of these factors should be explicitly reflected in the planning process products.

Except for the requirement to consider the results of the management systems, it is expected that MPOs for UZAs designated before the 1990 Census will comply with all of the ISTEA requirements for the planning process by 10/1/93.

LONG RANGE TRANSPORTATION PLAN

PROVISION--A long range plan for each metropolitan area is to be prepared and updated under a schedule determined appropriate by the Secretary. The long range plan must: identify all transportation facilities (including pedestrian walkways and bicycle transportation facilities), include a financial plan that demonstrates how the long range plan can be implemented, assess existing transportation system and to make the most efficient use of existing transportation facilities to relieve congestion, and indicate appropriate transportation
enhancement activities. There must be reasonable opportunity for public comment on the long range plan before it is approved. (23 USC 134(a) & (g)/FTA-Sec 8(a) & (g)).

GUIDANCE—Pending further guidance, MPOs should initiate activities to update their plans to address a 20 year forecast period, to encompass the required metropolitan area and to reflect all of the items specified for inclusion in the plan, as necessary. Consideration should also be given to the need for modifying existing public involvement procedures so that citizens, affected public agencies, representatives of transportation agency employees private providers of transportation, nd other interested parties have a reasonable opportunity to comment on the proposed plan. Such procedures should include opportunities for interested parties to be involved in the early stages of the plan development/update process. The procedures should include publication of the plan or other methods to make it readily available for public review.

The financial plan should compare the annual revenue from existing and proposed funding sources that are dedicated to transportation uses, and the annual costs of constructing, maintaining and operating the transportation system over the period of the long range plan. The annual revenue by existing revenue source (at the local, State, and Federal level) dedicated to transportation projects should be calculated and any shortfalls identified. Proposed new revenues and/or revenue sources to cover shortfalls should be identified. Existing and proposed revenues should cover all forecasted capital, operating, and maintenance costs. All cost and revenue projections should be based on the best available data and trends. While MPOs and States must adopt plans that meet these requirements, this does not preclude them from also developing an unconstrained "needs" plan.

Except for considering the results of the management systems, it is expected that all plans in nonattainment should be updated as soon as possible, but no later than 12/18/94.

Although transportation plans do not need to be approved by FHWA or FTA, copies of any new/revised plans must be provided to each agency. Additionally in nonattainment areas for transportation related pollutants, FHWA and FTA as well as the MPO will need to make a conformity determination on any new/revised plan in accordance with the CAA requirements and the EPA?DOT Conformity Guidance.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

PROVISION--A TIP must be developed for each metropolitan area by the MPO in cooperation with the State and transit operators. The TIP must be updated and approved at least every two years by the MPO and the Governor. It must include all projects (including pedestrian walkways and bicycle transportation facilities) to be funded under Title 23 and the FTA. There must be reasonable opportunity for public comment prior to approval. The TIP must include a priority list of projects to be carried out in each 3 year period after initial adoption of the TIP and a financial plan with funding reasonably expected to be available during the relevant period, and projects in the TIP must be consistent with the long range plan. (23 USC 134(a) & (h)/FTA-Sec 8(a) & (h)).
GUIDANCE--Pending further guidance, MPOs should consider the need to modify their TIPs to encompass the required metropolitan area and to include all of the items specified for inclusion in the TIP, e.g., priority lists of projects to be carried out in each 3 year period and a complementary financial plan. Where appropriate activities should be initiated to address specified items not currently included.

Since Federal Lands Highway projects must be included in the TIP, the MPO and the State will need to work with the agencies involved in the Federal Lands Highway Program at both the plan and TIP development stages to ensure full consideration of such projects.

Consideration should also be given to the need to establish or modify existing public involvement procedures so that citizens, affected public agencies, representatives of transportation agency employees, private providers of transportation, and other interested parties have a reasonable notice of and opportunity to comment on the proposed TIP. Again the procedures should include opportunities for early involvement in the TIP development process. As soon as possible, but no later than 7/1/92, the Governor or the Governor's designee must approve any new or amended TIP.

The MPO and the State in cooperation with transit operators are strongly encouraged to initiate a cooperative review of all projects currently programmed or proposed to be programmed in order to take full advantage of the increased flexibility of FHWA and FTA capital funds. Major ISTEA programs that provide this flexibility include the: (1) Surface Transportation Program (STP) which may be used for any type of highway or transit capital project involving either mode, (2) Section 9 transit capital funds which may be used for highway projects as long as certain specific conditions are met, (3) Interstate Substitution which allow up to 100% to be obligated for transit substitution projects, (4) Interstate Maintenance which allows States to transfer up to 20% to the STP and NHS under certain conditions, (5) Bridge which allows the State to transfer up to 40% to the STP, (6) NH which allows the State to transfer up to 50% to the STP without Federal approval, and (7) in ozone and carbon monoxide nonattainment areas, Congestion Mitigation and Air Quality Improvement Program funds which can be used for transportation projects and programs that are likely to contribute to the attainment of national ambient air quality standards. In nonattainment areas for transportation related pollutants if the TIP is revised or replaced with a new TIP, new conformity determinations by the MPO and DOT will be necessary.

NHS HIGH PRIORITY CORRIDOR

Section 1105 (h) of the 1991 ISTEA created a new discretionary funding category for the conduct of feasibility and design studies for the 21 high priority corridors on the National Highway System (NHS). The descriptions of these corridors are provided in Section 1105 (c). For FY 1992, $7,753,168 is available from the Highway Trust Fund for this program. Subsequent funding of $8 million for each of fiscal years 1993 - 1997 is also authorized. These funds are available for 4 years. The Federal share is 100 percent.
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GUIDANCE—Pending further guidance, MPOs should consider the need to modify their TIPs to encompass the required metropolitan area and to include all of the items specified for inclusion in the TIP, e.g., priority lists of projects to be carried out in each 3 year period and a complementary financial plan. Where appropriate activities should be initiated to address specified items not currently included.

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The Office of Environment and Planning (HEP-1) will have an interest in participating in these studies. Both the Office of Engineering and Office of Environment and Planning will be working jointly in the process of selecting projects for funding.

We encourage multi-State corridor studies and suggest States involved in the defined corridor consider reaching agreement for developing studies which cover a significant length of the corridor. In these instances, it would be highly desirable for one State to assume a lead role and submit the candidate project.

We are requesting submission of candidate studies for our consideration for funding in FY 1992 for the NHS corridors defined in Section 1105 (c) and the study defined in Section 1105 (e) (2). There is no prescribed format for the submissions. There should be adequate information to show the scope and nature of the proposed study; the study's overall costs; the amount of discretionary funds being requested; other funding sources, both Federal and non-Federal, being committed to the study; estimated study time schedules; estimated obligation date, and any other information that could prove useful in making judgements on the study. We are requesting a single page summary of facts be included for each candidate study.

Considering the relatively small sum of funds available, it is suggested a limited number of candidates be submitted. We request that each region rank in priority order the candidate studies submitted by the States. Regional ranking should consider your knowledge of the transportation needs and other relevant factors. Replies were due April 30.

You may call Mr. Jerry Poston at FTS 336-4652 if you have questions. Anthony Kane

METROPOLITAN PLANNING FUNDS - FTA

PROVISION--Three percent of the overall funds available for transit are set-aside for Planning, Programming, and Research. Of this amount 45% is to be made available to MPOs for metropolitan planning activities to carry out State planning and research activities. (FTA-Sec 21 (c))

GUIDANCE--As an interim measure, States are encouraged to allocate an amount to each UZA, or part thereof, within the State equal to the amount each UZA, or part thereof, received from the Section 8 National Program Plan in FY 1991. Any remaining amount of the State's apportionment could then be distributed on the basis of the new formula developed by the State in cooperation with MPOs.
SUMMARY OF TARGET DATES FOR IMPLEMENTING CERTAIN ISTEA METROPOLITAN PLANNING REQUIREMENTS

- MPOs should be designated as soon as possible, but will need to be designated in time to develop and approve a TIP by 10/1/92.

- Metropolitan area boundaries should be established as soon as possible, but will need to be established in time to ensure that the process, plan, and transportation improvement program (TIP) fully cover the metropolitan area no later than October, 1 1993.

- As soon as possible, but no later than 7/1/92, the Governor or the Governor's designee must approve any new or amended TIP.

- Although MPOs in newly designated UZAs will be given three years to establish a planning process, they will need to work with the State and transit operation to develop and approve a TIP by 10/1/92 that includes all projects to be funded under Title 23 or the FTA.

STATEWIDE TRANSPORTATION PLANNING PROCESS

Pending rulemaking by the FHWA and the FTA, each State is encouraged to: 1) review the requirements of 23 USC 135 and initiate steps to establish or modify its statewide transportation planning process to respond to these requirements and to include the management systems activities required by 23 USC 303, 2) review State/local legislative transportation and land use planning provisions and assess the adequacy of these provisions to comply with 23 USC 135, 3) review existing organizational arrangements affecting statewide transportation planning and programming and establish new processes as necessary, 4) initiate discussions with local officials and other State officials on nonmetropolitan multi-modal transportation needs, 5) coordinate with the metropolitan planning organizations (MPO) in the State on transportation needs and on the processes for integrating metropolitan plans and programs with statewide plans and programs, and 6) review existing public involvement procedures and identify changes necessary to meet the requirements of 23 USC 135. Where appropriate, discussions should be initiated with Indian tribal governments and appropriate Federal lands agencies to establish a cooperative process for planning and programming transportation improvements.

Pending further guidance, each State, in cooperation with Indian tribal governments, MPOs and local officials, are encouraged to 1) conduct an inventory of transportation plans and policies for both metropolitan and nonmetropolitan areas which can serve as an interim basis for the development of the statewide transportation improvement program, 2) identify appropriate organizational structures for use in developing the long-range multi-modal transportation plan for all areas of the state, and 3) establish an overall approach and schedule for developing a multi-modal transportation plan.
By October 1, 1992, each State must establish or modify existing public involvement procedures so that citizens, affected public agencies, representatives of transportation agency employees, private providers of transportation, and other interested parties will have a reasonable opportunity to provide input during early stages and later key stages of the development of the long-range transportation plan.

**NATIONAL RECREATIONAL TRAILS FUNDING PROGRAM**

Section 1302 of the ISTEA of 1991 establishes the National Recreational Trails Funding Program. The legislation authorizes $30 million per year for the program through FY 1997; however, funds were not appropriated for FY 1992. We understand that Senator Symms, the principal sponsor of the National Recreational Trails Fund Act, intends to sponsor a technical amendment to place the program under contract authority. We will keep you advised on the status of funding for this program.

Responsibility for the National Recreational Trails Funding Program has been assigned to the Planning and Programming Branch (HEP-12). Although funding may not be available this year, efforts are underway to develop procedures for implementing the program, including establishing a National Recreational Trails Advisory Committee, also required by the legislation. We will let you know more about procedures for administering this program as soon as we can. In the interim, questions regarding the program should be directed to either Mr. Tom Weeks, Chief, Planning and Programming Branch, (FTS) 366-5002 or Mr. John Fegan, FHWA Bicycle manager, (FTS) 366-5007.

Information from Anthony R. Kane.

**SPECIAL PROJECTS WITH FY 1992 ALLOCATION OF FUNDS**

SOUTH DAKOTA—Project Section Number 7—Conduct a feasibility study of an expressway from Rapid City to Scotts Bluff, Nebraska. Project Section Number 17—To improve the Heartland Expressway from Rapid City to Scotts Bluff, NE.

**TRANSPORTATION ENHANCEMENT ACTIVITIES**

Section 1007 (a) of the ISTEA, adding 23 USC 133 (d) (2), requires that 10 percent of the new Surface Transportation Program funds only be available for transportation enhancement activities. Section 1007 (c), amending 23 USC 101 (a), defines transportation activities. Section 1024, adding 23 USC 135, specifies that the statewide transportation improvement program shall reflect the priorities for programming and expenditure of funds, including transportation enhancements. This memorandum provides interim guidance concerning the interpretation of these provisions.
QUALIFYING ACTIVITIES-TRANSPORTATION ENHANCEMENT

Several field offices have asked whether the list of activities in Section 1007 (c) is exclusive or illustrative. It is exclusive. Only those activities listed in Section 1007 (c) are eligible to be accounted for as transportation enhancement activities. They are:

1. Provision of facilities for pedestrians and bicycles.
2. Acquisition of scenic easements and scenic or historic sites.
3. Scenic or historic highway programs.
4. Landscaping and other scenic beautification.
5. Historic preservation.
6. Rehabilitation and operation of historic transportation buildings, structures or facilities (including historic railroad facilities and canals).
7. Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian or bicycle trails.)
9. Archaeological planning and research.
10. Mitigation of water pollution due to highway runoff.

Activities which are not explicitly on the list might qualify if they are an integral part of a larger qualifying activity. For example, if the rehabilitation of a historic railroad station required the construction of new drainage facilities, the entire project could be considered a transportation enhancement activity. Similarly, environmental analysis, project planning, design, land acquisition, and constructing activities necessary for implementing qualifying transportation enhancement activities are eligible for funding and may be counted toward the 10% requirement.

Transportation Enhancement and Environmental Mitigation

The Congress included the language on transportation enhancements as a means of stimulating additional efforts in the activities beyond what is customarily provided as environmental mitigation can be considered as transportation enhancement. States may not use transportation enhancement funds to finance normal environmental mitigation work. We realize that the process of determining which activities will be considered as normal mitigation and which will be accounted for as transportation enhancement activities will be difficult. Initially, it will require close coordination between the State DOTs and their FHWA Division Offices on a case-by-case basis.

Project Linkage

The definition of transportation enhancement activities includes the phrase, "with respect to any project or the area served by the project." Given its overall context, we interpret this phrase to mean that the proposed transportation enhancement activity must have a direct relationship to the intermodal transportation system, but not necessarily to a currently planned highway project. This relationship may be one of function, proximity, or impact. For example an independent bike path is a functional component of the intermodal transportation
Financial Accounting

The funds made available only for transportation enhancement activities are derived from several sources. The main source is the STP, of which 10% is available only for transportation enhancement activities. In addition, 10% of (1) the funds resulting from reimbursements for segments of the Interstate system constructed without Federal assistance under 23 USC Section 160 and (2) the apportionment adjustments made pursuant to Subsection 1015 (a)-(c) of ISTEAA are available only for transportation enhancement activities.

The Office of Fiscal Services has already established an appropriation code for transportation enhancements and has notified the DOT of the FY 1992 STP suballocation amounts available only for these activities. While 10% of each year's STP apportionment may be obligated only for enhancements, there is no requirement that 10% of the funds for any given project be devoted to enhancement activities, nor is there a requirement that 10% of the STP obligations made during a given fiscal year be devoted to transportation enhancements.

Further Information

The transportation enhancement provisions offer exciting new opportunities to achieve the goals laid out in the National Transportation Policy, FHWA's Environmental Policy Statement, and FHWA's strategic planning process. This is an area that will undoubtedly evolve rapidly as we begin implementing projects under the new authority. We will be issuing additional guidance and sharing information on successful endeavors as the opportunities arise. The contact for transportation enhancement activities is Mr. Fred Skaer. He can be reached at FTS 366-2058.

*Questions and Answers, along with the general information presented here, are from the ISTEAA electronic bulletin board.
Glossary of Abbreviations

BIA--Bureau of Indian Affairs
IRR--Indian Reservation Roads
CMAQ--Congestion Mitigation and Air Quality Improvement Program
SIP--State Implementation Plan
TCM--Transportation Control Measure
EPA--Environmental Protection Agency
CAAA--Clean Air Act Amendments
STP--Surface Transportation Program
IM--Interstate maintenance
NHS--National Highway System
TIP--Transportation Improvement Plan
MPO--Metropolitan Planning Organization-South Dakota has two: Sioux Falls and Rapid City
FHWA--Federal Highway Administration
CMS--Congestion Management System
UZA--Urbanized Area, population of over 50,000.
FTA--Federal Transportation Administration
CAA--Clean Air Act
DOT--Department of Transportation
FY--Fiscal Year
NOTES
Conventional wisdom has it that if we build better transportation facilities, economic growth and development surely will follow. I'm going to look at that fairly closely with you this morning, if I may. I want to ask the question, "When will highway investments really spur economic growth and development and how do we measure all of this? What does it really mean?" I'm going to conclude with a case study analysis I was involved with along with Merritt Linzie, something called the Avenue of the Saints. I participated in the economic analysis for that project and it led to some fairly interesting results that I think you will find interesting.

Let's begin by asking, "What in the world is economic development?" If we can't get a definition of that, we're going to have a little trouble figuring out what the impacts are of a transportation project on economic development. When George Bush signed the ISTEA bill he said, "Really this is not so much a transport bill as it's jobs, jobs, jobs."

However, my definition and I think the accepted definition nowadays is that technically speaking, economic development is an increase in real income. That's net of inflation, where income grows faster than inflation (income in an area). I need to stress this to you. If you have 10 workers in an area and at the end of the day you still have 10 workers but they have had a 20% increase in pay, that's economic development. Just as surely as if you have 10 workers and now you have 11 workers, it's an increase in real income. For income to be increased one of several things has to happen. Either you have to consume more resources and produce more in terms of consuming land, labor, materials, capital; or existing resources must be employed more productively. Productivity gains are really what we are looking for. Deming has certainly pointed that out very effectively, I would say.

Government policy can have a major impact on economic development—positive and negative. Public projects can reduce the cost of doing business, and this can result in increased income and that's economic development. There is a dark side to this. The cost of those public projects generally has to be defrayed through taxation. And those taxes lower real income and expendable resources. So what we have to do is balance the two. A project
resource. It doesn’t matter what it is. Who is going to build the road and who is going to pay for the road?

Naturally the company, being rational, goes to the state government and says, "We would like to apply for funds" to a state program for road improvements. The road costs $2 million, so the company goes to the state and says, "If you will build the road, we will create jobs; we will diversify the states economy; we’ll do lots of good things." The state DOT (this is a wise state DOT I am characterizing) looks at the situation and says, "Yes, but if you build the road yourself, your net profits would be $8 million and if there were no DOT, clearly the rational thing for you to do would be to build the road. Better to have $8 million in your pocket than $10 million potential." Now who should build the road, who should pay for the road? Interesting question.

Spread It Out. This is a case where the state government is under considerable pressure to build roads in an attempt to spread economic development out across the state. The best example of that I know is the state of Georgia, where they are spending $135 million a year to connect all communities of any size at all to Atlanta via four lane roads. The argument being that we can spread economic development out by bringing it to people, rather than people coming to places of prosperity. The idea is to create better economic potential through the construction of various types of roads.

The difficulty here, of course, is that you have to ask, "Will the road make an area that is not terribly profitable or prosperous much more so?" That’s a hard question. If the other key factors of production are not present in this other location, building the road won’t make any difference. We’ve all seen miles and miles of four lane interstate highway in some of the plain states with virtually nothing going on. If the highway were a sufficient mechanism that would not be the case. The point is transportation is a necessary, but not a sufficient, condition for economic growth to occur.

The DOT has to ask, as an agency charged with promoting public welfare, what its objectives should be. If it spreads out economic development, many of the facilities are going to be comparatively inefficient, and that will have a destructive effect on the overall economic growth and prosperity of the state. You can’t maximize overall profitability for the state at the same time as you spread economic development out. That’s a normative question, one I’m not wise enough to decide. But I would simply argue that as politicians and other leaders grapple with this question that they understand consciously what the decision really means, the choices that they are forced to make.

Raise the Ante. The best case study of Raise the Ante, of course, was the Saturn plant. Who do you think really was the loser in the Saturn lottery? Minnesota wanted Saturn. People said, "Well, I’ll build sewers, I’ll build roads, I’ll do this and that." Of course we have this movie from Iowa called Field of Dreams, ‘If you build it they will come.’ They built lots of facilities and of course it was nice because it was jobs, jobs, jobs. In fact 6,000 jobs were going to be created at the Saturn plant. To date, the total is well below this figure. I’m only saying that the Chinese proverb about looking before you leap is probably wise.

In this case, a business comes to the state. It’s a clean industry. It’s going to employ some workers, it’s an environmentally sound, politically correct sort of industry, and it says, ‘I’m looking at other states too.’ So it goes to the Department of Economic Development to get a Job Training allocation. It goes to the local community and it gets tax relief. It goes to the DOT and gets a road. On it goes. Without single point funding, without single point review, the additive cost of all of these could very well actually greatly exceed the economic gains that the business brings about. So you had better look again, the various contributions
made by different agencies, and not vow that you will pay whatever it takes to get this facility.

Open Up the Amazon. Somewhat analogous to the Spread It Out paradigm is the Open Up the Amazon paradigm, which is not so much concerned about depressed areas the way Spread It Out is, but rather opening up undeveloped parts of the state to try and see if transportation can be a catalyst to exploit an area of the state that is not yet developed. The role of the railroads in the 1800's in opening up the west, of course, is legendary. Can transportation facilities today, namely roads and highways, do the same thing?

Recently industrial surveys have argued that many other factors are more critical to industrial locations than is transportation. Of course you could say that means transportation is not important. No, I don't think it means that at all. It does mean that the United States has a good transportation system that's ubiquitous enough that it no longer is a major factor. Having air to breath is more important than transportation, yet it isn't listed at all because everyone has it. Well, if transportation is becoming comparatively ubiquitous, it will fall as a decision factor. That's not the same as to say it's not important. But unionization, physical amenities, business climate, energy, tax rates always rate higher than transportation. That simply means that if you build a transportation facility into a comparatively underdeveloped area of the state, if these other factors aren't swinging in your favor not much is going to happen so the effect is comparatively similar to the Spread It Out paradigm.

The final one is the Carnival. The Carnival deals with footloose businesses. When we were designing the RISE program in Iowa, two former students of mine and I, we worried a lot about footloose businesses. When you build a road out to a facility, essentially it's got to be a public road constitutionally, but it really benefits certain activities. This activity locates correspondingly and then a slightly better opportunity avails itself in another state and it's gone. That's a footloose industry, and you are left holding the bag. Everybody has seen that happen. What can we do about it? One thing I think we want to consider when making these kinds of state investments is how footloose the industry is. The best indicator of that is the business's capital expenditures. If the business invests a lot of capital in the facility, and it therefore constitutes a major commitment by that business, then for the public sector to invest in its roads to go along with it makes a great deal more sense.

So the idea of these paradigms is to illustrate some pitfalls for the provisions that are worthy of attention as one contemplates the way in which a state such as yours ought to be investing its transportation dollars with the objective of economic development and growth. The point I am trying to raise in the end is whether society really gains. The cost savings of transportation lead to productivity improvements. We have to distinguish between cost savings that actually make society better off, lower the cost of doing business, moving people and goods, and projects that merely shift economic activity from one place to another. Most major projects will have both effects, and it is my argument that we need to take those two effects into account separately. One is sort of a political question; the other is truly an economic question regarding impacts. We need to draw a distinction between transfers and efficiency gains.

To understand what this transfer question really means we need to ask, "What will the impacts of the transportation improvement will be for the corridor, for the state, and for the nation?" I can tell you that in almost every case, if you view the corridor by itself (which is a traditional way to do these studies), it is going to look pretty sharp because activities will have moved to the corridor from other locations maybe within the same state and you are using state funds to build this project. So the corridor looks like a winner and if you limit your analysis to the corridor I think there is a possibility that you will overbuild. On the
other hand, if you look at the state you have to ask what kinds of activities might have transferred to the corridor from other places in the state, and that would tend generally to be the kinds of activities that would be, if John Adams were characterizing it, fairly low order activities that move quite readily and serve comparatively small areas.

Let's go to the real world—Avenue of the Saints. This was an opportunity for me. I had been thinking a lot about this question of transportation benefits that were a relationship between road improvements and economic development. Along came this opportunity to apply some of the theoretical and methodological issues that had been very important to my colleagues and me.

The Avenue of the Saints is about a five hundred mile corridor between St. Louis and St. Paul. Really it is more Minneapolis, but this is a catchier title and catchy titles help you get funded. The study was mandated by Congress in 1988. Wilbur Smith Associates, given due credit, was the prime on it and they involved a few academics to give them some ideas regarding concepts in the ways of doing things, and I designed the economic methodology. We started with a whole bevy of alternative routes and gradually they funnelled down to the final four. Then we had the issue of fifty-five mile per hour speeds or sixty-five. Many people still believe the Avenue of the Saints is going to be interstate quality. It's going to be a fifty-five mile per hour facility because the difference in cost of going from fifty-five to sixty-five is staggering. To build a sixty-five mile per hour facility under current law you have to have grade separations the whole way, it has to be of interstate standards and it costs at least twice as much to build a grade separated interstate than it does to build a four lane. Some of the transportation cost savings that were the objective here went into the negative column because it costs more to operate vehicles at sixty-five than fifty-five, and the air quality costs were negative as well.

What I was trying to do was develop a methodology that would separate these transfer effects I've been telling you about from real gains to society of the improvement and treat them differently. Little did I know as we went in that those transfer effects, how they were treated, would swing the cost of the project by $1 billion and have a major impact on which states got the Avenue. What kinds of cost savings are we really talking about here? These are the kinds of cost savings that make society better off. They are not transfers, they are real savings. Think of it this way. If Gary can become $100 better off by transportation cost savings and no one in the room has to pay anything for it, that is a gain to society. But if my business loses $100 a year in business so Gary's gains it, that's a transfer.

Transportation cost savings are of four types. Vehicle operating cost savings, that means it costs less to operate your vehicle. The road is smoother, less speed changes and things of that nature. It’s not the biggest one of the four. Accident cost savings can often times be very important. I was a technical advisor on a study that was just completed between Minnesota and Iowa on Highway 63 connecting Waterloo and Rochester. It was a question of upgrading it to four lanes. The biggest single benefit of the upgrading, which isn’t entirely feasible, is accident cost savings. That gets into a whole new research area I’m working on now, what is the value of a life? If you aren’t willing to quantify that, you can’t quantify accident cost savings; you don’t count them, so you are implicitly saying the value of a life is zero.

Without getting into a lot of excessive detail, there is an interesting issue about dread. People are willing to pay more to prevent accidents for which there is greater dread. You are all going to die, but there are some ways of dying that you dread more than others. One of the biggest ways is in the back of an airliner when it comes in for a landing and crashes and burns. That is something you dread. As a result people have been willing to pay
incredible amounts of money for wind shear detectors at the approach end of runways that are highly unlikely to save any lives, but maybe they will. Yet people are less willing to say that lives on highways in certain cases are as valuable. Think of it this way. You say, "I'm sure not going to ride in the back of that airliner, it's not safe," and then you say, "I know there's freezing rain, but I'm going to go over to play pinochle with my friends down the street. Because I'm in control of the car, I can get there." True? So you can't just say a life is worth something, it depends on the nature of the dread of the risk. It's an interesting topic.

Travel time savings is the biggest savings there is in terms of highway improvements, and you have a problem of how much you value time. There is a whole literature that I've spent a lot of time working on: short trips, long trips, what the person is doing and all that. By the way some people say wage earners should be given a higher value of time than children. You hear that. Well I heard someone the other day, one of my advisors on the project who happens to be a pediatrician, point out that a kid in the car seat is at that peak period of learning, and if instead of reading Richard Scarry, they are just looking out the window, then their ultimate intellectual development and contribution to society is weakened. Therefore the value of time for the infant is greater than some doctor or lawyer. Economic and environmental costs are another factor. If vehicles move along smoothly there is a chance to reduce that.

There are other kinds of effects of an economic nature that are transfers. Very few people consider construction a transfer. They should though. The construction benefits of a highway are no different than digging a big hole and filling it with concrete. It's a transfer from taxpayers to the people doing the construction, isn't that true? If you contribute money to me so that I will do something, whatever that would be, that is not going to make society better off. I'm richer, you are less rich. So construction is not an economic benefit. To argue jobs, jobs, jobs for building roads, it's really fallacious at the end of the day. I'm not saying construction isn't good. Construction is good if what you're building is good. The act of construction is a transfer.

Improvement in competitive position. That's this transfer business I was talking about, and that's a really important issue. There are a couple of forms of transfer. Big transfers are movements of large factories from one location to another. But there also are these roadside benefit transfers. Communities have almost a lemming instinct when it comes to bypasses. They think that a bypass around their town is a good thing. Sometimes it is if you have a lot of traffic going through town, it's disruptive. But then you see in these impact studies for bypasses, people count up the number of gas stations, sleep cheap and burger places that are going to locate there, and they add it up as a benefit. They get the bypass and everybody's happy at the ribbon cutting. Then a little while later a gas station downtown on the road that used to go downtown closes, and the restaurant closes and the hotel along the former route starts experiencing great losses in occupancy.

Roadside services are those footloose businesses we were talking about. On the Avenue of the Saints we have to recognize the fact that when people travel from St. Louis to St. Paul, they aren't going to eat any more hamburgers than they used to. They aren't going to sleep any more hours than they used to, and they aren't going to burn any more gas, in fact they may burn less. Therefore the transfers will be the dominant factor in these roadside services. Counting these things has always been part of the dogma of the profession. It's something we need to ask about.

Well, let's look and see what really happens. Let's begin with the capital costs of the four alternatives. The real competition, you are going to find out, is between alternative one and alternative three. Alternative three costs $1.3 billion. Route one would be the best one from
a cost standpoint, it would cost $358 million. That's about a billion dollar difference in capital costs. Let's see which one is the better. If we consider efficiency gains alone, these are transportation cost savings, the gains to society or the loss to society, route one is $74 million dollars ahead. This is a net present value over the life of the highway using the OMB's discount rate of 10%, which they mandated. You know about discount rates: if I give you a dollar a year from now, that's worth less than if I give you a dollar today because of the discount rate. We discounted the benefits. For alternative three the present value of cost savings is minus $361 million. Society thus would be much worse off if alternative three were built.

In terms of transfer effects, the histogram for alternative three is the greatest of the four. In fact, factoring in transfer effects, roadside businesses, changes in competitive position for industrial activity along the corridor, ignoring where it came from, the net present value of benefits for alternative three is $573 million. For route one it's $514 million. So it all comes down to this: if you consider those other impacts side by side with efficiency gains, you have no choice. You've got to build alternative three. It's the best bet. It costs $1 billion more, and it would make society $361 million less well off than if you didn't build it, but considering the transfer effects, that's your best alternative. I know this is starting to sound just almost evangelical but I just want you to think very hard about how to separate the effects of roads and economic projects; if you consider transfer side by side with gains of society it can lead you astray real badly. In this case, wise minds prevailed, and the route went through Iowa.

The main conclusions we got from that and two projects similar to it we've done since, where we keep applying this methodology and we get a little bit more knowledgeable about it as we work with it, is that generally when you view the scale of impact of projects on economic growth and development, changes in competitive position (that is the ability to get an industry to move from Ohio to Minnesota or what have you) are comparatively small actually. For the reasons I mentioned earlier, transportation is not likely to be a major deciding factor in how industries choose where to locate. Increasingly amenities, trees and so on, are becoming crucial because the managers—getting good managers to run your plants—is a crucial factor. If you locate the plant where no one wants to live your ability to run it effectively is weakened, so what you want to do is worry about amenities frequently. Cost savings alone leads to very different results if you include transfer effects. That raises questions about the federal policy.

Considering only efficiency gains that make the nation better off, that should be the hallmark of federal policy, because if you consider changes in competitive position along with it, then the federal government is subsidizing the relocation of activity from Minnesota to Ohio. That isn't necessarily a good thing unless there is a clear social policy reason for doing so, which is why of course highways were built in Appalachia, the attempt was to get activity to locate there.

My research tells me that if your objective is to encourage development in Appalachia or some part of Iowa or someplace, there are a lot more cost effective ways to bring that about than building ribbons of progress (that's euphemism for four lanes) out to those areas. It just isn't likely to work. When I presented some material of this sort at a conference with mayors present, one of them questioned that idea. I asked the good mayor, "Let's suppose we had two alternatives. One was a $10 million road that would increase the speed with which people could travel from your town to the interstate, would you like that?" He said, "Yes, that would be very nice." "Or $2 million in cash, where the community could spend the two million anyway you want, job training, luring businesses, promotional materials, anything you want. Which would you rather have?" The mayor said, "Well you know, the road
would be a terrific thing, but I’d take the cash." He just defined a benefit cost ratio for the road to point two. He’d rather have $2 million than the $10 million road. It’s a tricky business.

I want to conclude just by touching on the current project we’re working on, which is funded by the Northwest Area Foundation—Terry Saario, one of the grandest people in the Twin Cities—the US DOT, Iowa DOT, Iowa State University, University of Iowa and the Iowa Business Council, which is made up of the twenty-two CEOs of the largest firms in the state. They all put their funds together, to pay for a study done at the Policy Center to explore how transportation can best help strengthen the economic prospects, in this case for Iowa, with an eye toward developing a methodology that could be applied in other states, including yours.

To do this, I assembled a group of people, some of the top leaders in the state, the chairs of the House and Senate Transportation Committees, the Commissioner of the Iowa DOT, the president of the largest trucking company, president of a small trucking company, presidents of two railroads, a barge company, the head of the Teamsters, the head of the Farm Bureau, a whole group of people. We got them in a room and we started talking about the key issues that were affecting the state. Then my research team did a great deal of background material. I think we distributed one of the first reports. We then started doing a great deal of research. What we found in many cases in many is that there is some magic to be had in being prudent. Super two highways constitute a very viable alternative worthy of your consideration. Everyone in Iowa, like everywhere else, wanted four lane highways.

The question is whether we should spend the limited resources available building four lane highways wherever we can until the budget is exhausted, building the best ones first, or whether we should ask other questions. Are there alternatives that would allow more people to be served with the same amount of money to accomplish more or less the same benefits or even greater benefits? The answer became a resounding, "Yes, there is." The idea seemed to gravitate toward the notion of a super two highway. A super two highway would look a lot like half an interstate. Wider lanes, twelve feet wide, ten foot shoulders, ideally paved but not necessarily, with passing lanes in rolling topographies so you don’t get trapped behind a vehicle for a long period of time, bypasses around communities because there are great travel time savings to be realized by not going through a town along the route, and turn lanes for avoiding vehicle conflicts mainly going in the same direction. Put all that together, the cost of a super two is about one-third that of a four lane divided on a per mile basis. Think about it—you can build three times as many miles of super twos as you can four lanes.

Then we did some modeling, some traffic flow modeling. We found that about ninety percent of the benefits you get from a four lane can be gotten by the super two. In fact, the traffic flows were essentially identical in terms of the flow of the mean speed, if you will, of vehicles traveling along that corridor. The key is those passing lanes where needed. Safety benefits. A recent publication by the Transportation Research Board on the effects of geometric improvements on safety indicate that a very high fraction of savings that you could ever get from going to a standard two lane to a four lane are captured by the super twos. You could build a lot of super twos connecting a great deal of economic activity instead of building a limited number of four lanes. Furthermore, generally to build a four lane, to justify it, you need about 6,000 average daily trips over the corridor. What if you don’t have that? Well, you can justify a super two much lower than that so more people can benefit. I sound like a super two sales person, but I really think this is something that you should be asking yourselves as you look at Minnesota’s future in terms of investment in facilities. You can get burned by over-investing in a given facility as surely as you can by under-investing where clearly you need it. The nice thing, too, about a super two is that it
can be the first installment toward a four lane. You build a super two, you might want to get an option on the land allowing you to have the other two lanes, or you might purchase them if there are developmental pressures on the land. That's not that expensive, I mean it can be but in not really in non urban areas at least. And if the traffic volumes increase over time, up to four, five, six thousand, then you go ahead and build the other two lanes and now you've got a real high quality four lane divided system.

We raised questions about pricing and strategies for trucks. I gave a presentation to the executive committee of the American Trucking Association down in Key Largo several weeks ago about truck pricing. We talked about these kinds of things, how we price vehicles and how we make use of the technology. Weighing vehicles as they travel down highways so you immediately assess their weights, and then to have automatic vehicle identification (AVI) to know who is making the trip. You would be able to bill motor carriers at the end of the month on a diskette, the way they do in Oklahoma on the Oklahoma Turnpike Authority. It doesn't delay the trucks. You don't have to have drivers carrying change and yet you could price the roads appropriately. You can even include a form of congestion pricing in that kind of mechanism. There is a lot of hope in using this technology. It's all off the shelf right now. There is no need to develop anything new, it's there already. That's something we're suggesting be considered. You wouldn't have the evils of weight distance taxation, where a truck is charged at a large amount per mile, even if it's running empty. That's not fair. That's been a problem with weight distance. With this kind of technology you would have more of the ton mile tax where the vehicle would be charged according to the weight it actually carries.

One of the more controversial areas of our study is the issue of LCVs (Long Combination Vehicles). That's a very controversial issue that's fraught with emotional feelings. On our project the president of a trucking company pointed out that the safety record of LCVs is quite good. Have any of you seen the ad in the Washington Post at the time Congress was deciding if it should allow triples and long doubles on the interstate? It showed a picture of a mother in a little Ford Fiesta with a kid in a car seat in the back. She has this look of unbridled terror, even the kid looks scared. This big long truck is cutting her off, the driver is just going along, and the endorsing groups at the bottom were essentially saying that these trucks are killer trucks. That's something where I think we need to take a good long look at. Clearly the highest cost in trucking is labor, and these longer combination vehicles reduce labor dramatically. So there you have kind of an interesting policy question. On the one hand there is an opportunity to reduce costs and therefore increase productivity. On the other hand there are concerns about safety. My suggestion is we look at them very closely and as objectively as possible to decide. I don't have the answer yet, but I'm saying that we should look closely at the safety implications and let that direct where our thinking is.

The question of investment in the locks and dams in the Mississippi is a big concern for you. Each of those locks and dams will cost about $300 million to refurbish. There's a lot of pricing questions that people are asking: the size of the use tax, the fuel tax paid by barges, the sequence of rebuilding and questions of that nature, infrastructure. The costs are just enormous and we can't just sit back and do nothing, because by doing that we are making a policy choice, the choice is to ignore them. They're sitting up, they're falling apart. They had a fifty year life span; they were built in the thirties. So there is a lot that needs to be asked about that. The question of helping rural areas in terms of place prosperity or maximizing the economic gain to the overall state, which generally means focusing more of the investment in urban areas. I'm not here to tell you what I think you should do because it's a question of your own choice in what you want your state to be and do. I am suggesting that these are the tradeoffs that you have to make. If you don't make them
consciously you will make them but you’ll make them subconsciously, and that’s not as good.

In short, our research project on transportation improvements and the economic future of the Midwest is looking at a series of investment decisions. We adhere to the proposition that good transportation investments can advance the region’s economic prospects. We need to keep a critical eye on these investments to enable transportation to be a cost effective, positive attribute that helps make our region competitive.
The Once and Future Transportation Plan

For decades highways have been kings of the road: dominating transportation policy, taking charge of its funding. But no longer.

With the passage in 1991 of a major new surface transportation bill, Congress shifted policy away from a single-minded obsession with Interstate highways and focused it on a variety of means of moving people and goods.

These changes, as expressed in the Intermodal Surface Transportation Efficiency Act, offer unique opportunities to state and local officials: It lets them decide for themselves the most suitable forms of future transportation for their regions—from new high-tech subways to low-tech car-pool lanes. “Our idea is to let states compete among themselves. Let them learn from each other’s mistakes; copy each other’s successes,” says U.S. Senator Daniel Patrick Moynihan, a principal architect of the transportation act. “Those who make wise decisions will prosper. Those who make poor decisions will pay.”

This edition of The Public’s Capital highlights three areas of the new transportation bill that pose significant opportunities and challenges to state and local governments:

• Devolution. Decision-making authority moves away from the federal government to the states, and in urban areas, from state agencies to metropolitan planning organizations. MPOs, rather than departments of transportation, will have a chance to call the shots, deciding which projects the region should invest in.

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Who Gets What: The Major Funding Provisions of ISTEA

National Highway System: $21 billion for construction and repair of Interstate highways and major state roads. States can transfer 50 percent of the money to the Surface Transportation Program. States can also spend highway money on non-NHS projects that will improve traffic flow on national highways. An additional $17 billion is earmarked for Interstate maintenance.

Surface Transportation Program: $23.9 billion for roads, transit, transportation enhancement and safety. Some of the money is allocated by formula to urban areas. An additional $14 billion from four other programs can either be transferred to the Surface Transportation Program or spent on projects eligible for the program.

Transit: $12.4 billion for new systems and equipment. Of that, 40 percent is for new starts, 40 percent for rail modernization and 20 percent for bus and other uses. About half the money is to be spent on 64 specifically authorized projects. In addition, $17.4 billion has been earmarked for transit operating assistance.

Congestion Mitigation and Air Quality Improvement Program: $6 billion for projects that will help areas struggling to achieve air quality goals.

Interstate Completion and Trade-in: $13.4 billion to complete the Interstate system and honor prior commitments for Interstate transfers to rapid transit projects.

New Technologies: $660 million for smart cars/smart highways research and development; $725 million for research and development leading to the production of a magnetic levitation train system.

Special Projects: $6.2 billion earmarked for 538 specific projects, such as replacement of a bridge in Portland, Maine, and improvement of an expressway in Chicago.

Bridge Repair and Replacement: $16.1 billion for continuation of existing bridge program. Up to 40 percent of a state’s bridge funds may be transferred to the National Highway or Surface Transportation programs.

The PUBLIC’s CAPITAL, a quarterly forum on infrastructure issues, is prepared for GOVERNING under the direction of Marshall Kaplan, dean of the Graduate School of Public Affairs, University of Colorado at Denver and Alan Altschuler, director of the A. Alfred Taubman Center for State and Local Government of the John F. Kennedy School of Government, Harvard University. David Luberoft of Harvard University and Peggy Cuciti of the University of Colorado serve as co-editors. All unsolicited articles in The PUBLIC’s CAPITAL are the work of Cuciti, Luberoft, Altschuler and Kaplan. The publication of The PUBLIC’s CAPITAL is coordinated for GOVERNING by Penelope Lenov.

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GOVERNING
The States and Localities

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DEVOLUTION

Ready or Not, Here Comes Regional Power

If there's one point of agreement on the new transportation bill, it's this: Putting regional planning councils in charge of decision making is the biggest gamble in the whole bill.

Congress is betting that these low-key advisory units—metropolitan planning organizations, by official moniker—can turn themselves into Type-A agents who wield political clout as they coordinate policy, set priorities and make hard funding decisions. Without such a transformation, the high hopes for ISTEA as a force for change in urban transportation policies may not be realized.

Congressional sponsors of ISTEA latched on to MPOs as a way of changing transportation policy: They wanted less emphasis on building roads and more on custom-fitting alternative investments, such as mass transit or car-pool lanes, to regional transportation needs. There was widespread concern that state transportation departments had too ingrained a bias toward road building and had been relatively insensitive to the impact of highways on urban areas and environmental goals.

MPOs, on the other hand, tend to represent a variety of metropolitan interests. As such, they were perceived to be in a position to push states and localities toward investments that encompass a variety of solutions for regional traffic and air quality problems. "We don't know how this will play out," admits John Bosley, counsel to the National Association of Regional Councils, which represents MPOs and other regional groups. "But we think we've turned a corner and the old road gang has lost control."

The new act requires states to allocate a fixed percentage of available funds to urban areas (see sidebar on allocations, p. 66). MPOs for urban areas larger than 200,000 people (as well as MPOs in smaller areas that have not met air quality goals) are given the responsibility of deciding, in consultation with state DOTs, how to spend that money.

MPOs are not accustomed to exercising real power. Created in the 1960s and early '70s, MPOs have been advisers to local governments on transportation, urban renewal and land use activities. They prepared metro-area plans but those rarely had much impact on hard-nosed spending decisions. Anxious not to offend any of their local government participants, MPOs produced long, unproritized wish lists of projects. State DOTs were precluded from funding unlisted projects but they could, and routinely did, pick and choose from the list with broad discretion.

The new act dramatically changes these historic practices by requiring the MPOs to set the priorities. They will for the first time have to balance urban and suburban interests, choose among transit and road investments, and reconcile mobility with clean air goals. "The funding allocation power gives MPOs considerable clout," says Bruce McDowell, director of research for the U.S. Advisory Commission on Intergovernmental Relations. "Now they have some chips when they come to the table. That has been their biggest problem until now."

While they may have new powers, the bigger concern is whether they'll know how to use them. McDowell notes that regional councils of government, which serve as MPOs in many parts of the country, have proven themselves useful institutions for exchanging views, discussing issues, and providing data and analysis. "[However] most have not proven themselves as political policy makers, especially when the issues are controversial."

The ability of MPOs to grow into their new role is complicated by confusion over delineation of responsibility, especially in regard to state agencies. The bill contains language that requires consultation and cooperation between state DOTs and MPOs. This means that state DOTs are sure to be key actors: They have the technical expertise and they control the state funds needed to match federal grants. Some fear that state planners may attempt to subsume the MPO process. Others such as Ray Chamberlain, president of the American Association of State Highway and Transportation Officials, are worried that one result of legislative murkiness will be that "nobody is in charge."

Others expect assure local policy makers, who may have ignored MPOs in the past, to focus on making the regional organizations work. Bill Roberts, legislative director of the Environmental Defense Fund, which strongly backed the MPO provisions, figures that when the MPO wasn't that important, "a mayor might appoint his brother-in-law as his representative. Now that the MPO has power, you can be sure a mayor will make sure he has somebody good representing him on the MPO."

Larger jurisdictions will probably move to gain greater control over the MPOs, many of which are dominated by smaller jurisdictions in their metropolitan areas. In the Denver metropolitan area, for instance, the Council of Governments, which serves as the region's MPO, makes most of its decisions via a majority vote of all governments. There is a little-used provision in the organization's by-laws, however, that allows weighted voting. This could be invoked if a larger jurisdiction felt pushed to protect its interests.

There are also a number of structural problems that could make life miserable for MPOs. ISTEA calls for transportation plans to be coordinated across types of transportation, local governments and policy sectors, specifically those involved with air quality, land use and transportation. The law, however, doesn't adequately address the structural fragmentation that makes such coordination difficult. Large metropolitan areas are frequently divided into several MPOs. In addition, air quality and congestion management may be handled by a layer of agencies with non-overlapping jurisdictions. This patchwork structure reflects a distrust of regional governance typical of many local officials and residents.
Finally, for all the hoopla surrounding their new role, MPOs will control only about $9 billion of the $150 billion authorized by ISTEA. As Lawrence Dahms, executive director of the San Francisco Bay Area MPO, notes, "We have to reconcile expectations about resources. The amount of money we are receiving in the Bay Area will not even pay for two interchanges in our current plan."

By most accounts, devolution of power will produce a variety of outcomes. In some areas, there will be substantial shifts in the types of projects that receive funding. In others, the outcome may be the status quo. In yet other areas, there could be institutional gridlock. What is clear is that MPOs, which have long decried their lack of power, are being given a chance to prove themselves in action. The test, notes Dahms, "will be street-level performance. We have to think in terms of outcome, not as we have in the past, just of process."

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**The Big Question: Can MPOs Do the Job?**

Congress granted significant powers to metropolitan planning organizations. Can they fill the shoes Congress set out for them?

**Yes. The good news is:**

1. MPOs have a flexible outlook. Unlike state departments of transportation, which traditionally make investment decisions, MPOs do not have ties to a single transportation solution, such as highways.

2. MPOs are experienced. They've had to coordinate the concerns of several jurisdictions, special interests and assorted government agencies at one time.

**No. The bad news is:**

1. MPOs rarely set priorities, made funding decisions, exercised real power.

2. MPOs don't have the technological expertise to develop sophisticated models that can predict relationships between transportation improvements, congestion, air quality and land use.

3. MPOs don't have clear lines of responsibility. ISTEA leaves things murky on the relationship and divisions of responsibilities between MPOs and state agencies. With their greater experience, state agencies may be able to run roughshod over MPOs.

4. MPOs face structural barriers in coordinating policy. Large metropolitan areas, for instance, are often divided into several MPOs. And air quality and congestion management are often handled by other agencies whose jurisdictions don't overlap the MPO's.

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**CLEAN AIR**

**Transportation's New Priority**

Cleaner air or faster commutes? That's been the policy question for more than two decades. And one that the new transportation bill resolves in favor of clean air.

It does so by making it significantly more difficult to build new highways in areas that fail to meet federal clean air goals. Instead, the act encourages states and localities to attack traffic problems through mass transit systems, special lanes for high-occupancy vehicles and other facilities designed to provide alternatives to solo automobile travel. The idea is to reduce pollutants from automobiles by cutting back on the number of miles cars travel.

This aspect of the transportation bill delighted environmentalists, many of whom fought hard for it. "We hit a lower-deck home run," says Bill Roberts, legislative director for the Environmental Defense Fund.

But that victory, however heroic, may be hollow. By targeting the attack on automobile mileage, the transportation bill may not be as effective in cleaning up the air as its sponsors and backers hope. In fact, the transportation investments encouraged by the bill and most likely to emerge in the coming years have little potential to reduce air pollution. At best, they may only keep it from getting worse.

This is not the first time a transportation bill has been linked to air quality. Since the mid-1970s, federal law has nominally mandated that transportation investments conform to clean air goals. But the federal commitment to enforcement was weak, and states found ways to get around the requirements. Some refused to include in their plans options aimed at reducing total vehicular miles traveled—VMTs—in transportation jargon; others drew up plans but neglected to fund them. In addition, transportation departments were able to include new road construction projects as part of their strategy for cleaning up the air. Their rationale was simple: Congestion is highly polluting; new roads relieve congestion. What they neglected to say is that additional road capacity induces more travel, which over time may fully negate air pollution gains.

ISTEA gets tough with these past practices. Transportation agencies will now have to establish targets for reducing total automobile travel and demonstrate that these targets are being achieved. VMTs will have to be taken seriously. As the Environmental Defense Fund's Bill Roberts puts it, "Can [the mandated targets be achieved] without dealing with VMTs? I would say that it is virtually impossible."

ISTEA supports strategies for dealing with VMTs in three important ways: It allows a much larger share of transportation funding to be used for mass transit and other alternatives to road construction. It shifts the locus of decision making from state transportation departments to metropolitan planning organizations (see previous story), where transit is likely to get a more sympathetic hearing. And it eliminates "phantom projects" by requiring that regional plans rank projects by priority and build them in that order.
A Primer on Pollutants, Congestion and The New Transportation Policy

The link between transportation and clean air is rooted in chemistry. About 50 percent of the chemicals that combine to form smog are emitted by motor vehicles, as is about 90 percent of the carbon monoxide in urban air.

Since the 1960s, policy makers have tackled this problem in two ways. First, they emphasized reduction of emissions through technical improvements in automobile engines and gasoline. Then they regulated emissions from new and existing stationary sources, such as factories, power plants and the like. These two strategies produced substantial reductions in emissions and a noticeable improvement in air quality. Moreover, they proved to be popular with politicians because their costs, while large, are not readily apparent to voters. Instead, they are hidden in the prices of products such as automobiles.

There is also a third line of attack: reduce air pollution by cutting back on automobile travel. But that approach has never been seriously pursued. There have been public subsidies for mass-transit systems, but the effects of those systems on automobile travel have been invisible. Regulatory actions, such as mandatory no-drive days or limits on employer-provided parking, and pricing policies, such as parking surcharges at work sites, have invariably floundered in the face of their unpopularity.

The result is that while automobiles are much cleaner than those of the early 1970s, the gains from emissions reductions per vehicle mile traveled have been significantly offset by increases in automobile travel. In the Los Angeles area, for example, where the population has increased by 50 percent in the last 20 years, auto emissions have been reduced by about 70 percent but total vehicle miles traveled has doubled. The net effect is that automobile-created pollution dropped about 35 percent. In areas where travel growth has been slower, pollution reductions have doubtless been greater. Even so, many areas have been unable to attain the nation’s ambitious air quality goals.

This approach, if implemented, represents an almost complete reversal of historic patterns in transportation decision making, contends Denver city councilman Ted Hackworth, chair of the National Association of Regional Council’s task force on the surface transportation bill. “The local political and development interests must understand that transportation must address the Clean Air Act first and development needs second.”

Will it work?

Until regulations implementing the new clean air and surface transportation laws are written, it is impossible to predict how states and metropolitan areas will respond to the federal policy direction. Recent experience in Los Angeles suggests, however, that many of the measures most likely to be implemented have only limited impacts on air quality.

Since the late 1980s, the Los Angeles area, the most polluted in the country, has undertaken an ambitious program to improve air quality. Its 1989 plan calls for quadrupling transit ridership, eliminating 5 million daily work trips through telecommuting and eliminating another 1.7 million daily work trips via ride sharing—all by the year 2010.

Achieving these goals requires substantial efforts, and they are being made. Ride sharing is encouraged through investments in special car-pool lanes and by regulations that require employers to develop transportation management plans that reduce the number of vehicles employees use to commute to work.

Martin Wachs, a professor at the University of California in Los Angeles, has been monitoring these efforts. He’s found that substantial increases in carpooling occur only when employees face negative incentives, such as parking charges. In Century City, a major mixed-use employment center, Wachs reports, 92 percent of those who receive free parking drive to work alone. By contrast, only 74 percent of those who have to pay for parking drive to work alone. “It is very difficult to get very large shifts from single-occupant commuting to ride sharing by employing only incentives for ride sharing,” he claims. “We must also pay attention to reducing the incentives for driving alone.”
Employees are not necessarily passive in the face of such regulation. Public employee unions in the Los Angeles area worked to get a rule adopted that prohibits the region's Air Quality Management District from adopting any regulations that violate collective bargaining agreements or place an undue impact on the poor. If free parking is considered a fringe benefit, its removal violates the first element. The use of parking charges to induce carpooling could easily qualify as a violation of the second.

In further efforts to lure commuters from their cars, the Los Angeles plan calls for spending more than $43 billion on mass transit. Yet almost every study of ridership shows that few mass transit riders are reformed car commuters and most new subway riders used to ride the bus.

Chang-Hee Christine Bae of the University of Southern California estimates that all of the mode shift strategies in the 1989 Los Angeles plan—employer ride sharing, elimination of parking subsidies, auto use restrictions, increased carpooling, transit improvements—will produce less than 2 percent of the total projected reductions for each of the two chemicals that are precursors to smog formation and about 5 percent of the plan's projected reductions in carbon monoxide (see sidebar on pollutants, p. 70).

Bae adds that implementing all the plan's travel reduction strategies—alternative work schedules, telecommuting, better land use planning—will produce 13 and 21 percent reductions in the two precursors to smog formation and a 31 percent reduction in carbon monoxide. "Even if they could be achieved," Bae concludes, "the VMT-reduction measures [in the Los Angeles plan] make only a modest contribution to the total emissions reductions."

There are several reasons why VMT-reduction strategies have limited effects on air quality. Most pollution from automobiles comes when cars are first started and when they cool down after being turned off. In an average 10-mile trip, roughly half the pollution is from this phenomenon. Thus, a shift from automobile to transit will have little impact if workers still drive to the transit station. Similarly, telecommuting can reduce the number of work trips made each week. There is some evidence, however, that workers are likely to respond by moving their residences further out into the country which could, in effect, then lengthen the remaining work trips.

Because the gains from behavior-changing measures are so limited, it may make more sense to reduce emissions via emerging technologies. Consider, for example, the work done by Professor Donald Stedman of the University of Denver. In collecting data on 300,000 cars under actual travel conditions, Stedman discovered that half the emissions came from less than 10 percent of the fleet. It makes more sense to concentrate on these vehicles, he suggests. One way to get the diehard offenders off the road is by using a mobile emissions monitoring device. Such devices could be deployed to haul in polluting cars the same way radar is used to catch speeders.

Such an effort, however, may be hindered by policies that focus on VMT as a surrogate measure of automobile pollution. Yet, despite evidence that a strategy of reducing VMT's produces minimal gains at relatively high costs, there has been little call to re-examine that approach.

One explanation is that VMT reductions would facilitate achievement of a number of other goals, most notably congestion relief, open space preservation, energy conservation, city revitalization and prevention of global climate change. Another comes from environmentalists who say that the nation's goal ought to be to reduce all forms of air pollution regardless of cost. Since air quality goals outlined in the Clean Air Act cannot be fully attained through other means, even steps with small impacts must be undertaken.

But there has been little effort to question whether air quality goals are realistic. As Alan Aleshuler, director of Harvard University's Taubman Center for State and Local Government, noted in his 1979 book, The Urban Transportation System, those standards are designed to guarantee pollution levels "that can be tolerated by anyone, however ill or fragile, without ill effects... By way of comparison, a safety standard that entailed zero levels of mortality and personal injury would be achieved only by a total ban on travel."

While the rhetoric of the Clean Air and Surface Transportation acts suggests that stringent measures will be taken to achieve clean air goals, it is entirely conceivable that there will not be the political will to make hard decisions. Policy makers must discern whether the goals merely reiterate a society's hopes or actually give voice to a national commitment.

GOVERNING April 1992
THE IMPACTS OF TRANSPORTATION INVESTMENT AND PERFORMANCE ON AGRICULTURAL ECONOMIES

Denver Tolliver
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Upper Great Plains Transportation Institute

I. Transportation Investment Options and Criteria

II. Transportation Investments and The Agricultural Economy

III. Railroad Investment Issues
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I. Investment Areas Related to Economic Development
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   - Operations
   - Technology
   - Planning and Management

II. Investment Options
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  - Investment Analysis and Project Selection
  - Management Systems and Data Bases

- Waterways
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- Multimodal Connections, Terminals, and Facilities

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Impacts of Reduced Highway Funding on Household Income and Business Volume

Highway Funding

Pavement Serviceability

Travel Time

Vehicle Ownership

Fuel Consumption

Maintenance Cost

Distribution Cost

Truck Rates

User Fees

Net Farm Income

Household Income

Gross Business Volume
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CONSULTATION I: SOUTH DAKOTA TRANSPORTATION AND ECONOMIC DEVELOPMENT
by: Dr. Arthur Rolnick

Thank you, Richard. One thing Richard forgot to mention, I am the Director of Research at the Federal Reserve Bank in Minneapolis, and it's not that I like to brag but I was the only economist in the Ninth Federal Reserve District, and that includes Minnesota, North Dakota and South Dakota, Montana, part of Michigan, and Wisconsin. I was the only economist to predict that the stock market would crash in October of 1987 and that's because - and this is a true story - one month to the day before that crash, my father-in-law called and said he was going to start buying stocks again. Yes, it's a true story. The Federal Reserve System is involved, as you know, with lots of issues. Usually, when I give talks to audiences like this, I'm talking about the national outlook. Fortunately, I can report that in this town they probably didn't know there was a recession, we've heard so many good things about Sioux Falls. It looks like the signs of recovery are starting to show through. The consumers are starting to spend again, the regional economy has actually done quite well, as a whole for this recession period. Much better than the national economy, and this state - in particular - is one of our star states, and Sioux Falls is one of our star cities. But we don't just look at national issues.

While we have the responsibility for controlling the money supply, and encouraging economic growth, and development nationwide, the Federal Reserve System is divided up into twelve districts - you are in the Ninth Federal Reserve District - and we are responsible for reporting back to Washington on a variety of regional issues. As a result we get involved in some major economic issues that affect the citizens of the Ninth Federal Reserve District. Recently, in fact, - now that I have a listing of all the participants - you'll all be receiving, whether you like it or not, a copy of our Federal Gazette. In this next coming issue we will be looking at water usage issues. A couple of our directors from South Dakota, Ron Folberg and Chuck Seaman, both recommended that we do some research on this issue and you'll be receiving a copy of those results. And you have a copy, I believe, in your packet on the March 1990 Federal Gazette that looked at the transportation issues in our district. So that's how I initially got started looking at what I call infrastructure issues. I want to address the issue about the shortfalls in U.S. infrastructure - roads and bridges, and sewer systems, etc. There has been quite a bit written about this shortfall. I also want to make the case, that despite the transportation act that was passed by the President last year, (allocating something like One Hundred Fifty Five Billion [dollars] over the next six years), these funds even if used appropriately, we are still...
going to have a shortfall. What I would like to do first is talk about why a shortage is possible. We tend to think of shortages as occurring in countries like Russia that don't rely on free markets, and people line up to buy goods and services, of which there are very few. We don't tend to think of shortages in our economy, and yet I will argue that there can be a shortage in these type of goods that we define as infrastructure. Then I want to talk, look at the case for while there is a potential for shortage, I want to look at the literature for what has been written about the actual shortage and try to make the claim that sure enough it's not just potential, but we're seeing a shortage across this country. Finally I'll look at correcting the shortage and what it will require. In particular, it will require us to make better use of the resources that we have - and they are going to be limited [resources].

So let me begin by talking about why a shortage is possible. We tend to think of markets working in a way that you don't have a shortage problem. Prices adjust and when goods become scarce as prices rise, people buy few of the goods; as prices rise it induces more producers, more production - and so markets tend to be fairly efficient and tend to eliminate shortages fairly quickly. They tend to be efficient in a way that the price mechanism, works so it equates what economists call marginal benefits to marginal costs. When that's done, and generally that's what markets do quite well, it leads to a very efficient outcome for most goods and services produced for those who want them. That's what Adam Smith wrote about back in 1776. But markets don't always work well for all types of goods. Economists have identified three types of goods in which markets don't work well, in which you can't rely simply on a price system. I'm sure you're all familiar with these types of goods once I mention them. One type of good is what I call a spill over good, goods that have spill over effects so your consumption doesn't just affect you, it affects your neighbor and your community. We have spill over goods that have positive effects. We have spill over goods that have negative effects. Education, for example, the education of your children doesn't just affect your children, it affects the community enlarge. It's what democracies are all about. So, in this country we have seen education as important. Not simply private education but significantly subsidized and funded public education. Again, because of the spill over effects.

Public health, certain parts of which are very important. Your health conditions can effect your neighbors and your community. Again, spill over effect. Most of us have heard, for a number of years about pollution - whether it is noise or air pollution. Those are goods that also have spill over effects. So your consumption also effects the consumption of your neighbors. It's those types of goods, the spill over goods, which markets actually fail. The price doesn't work because the price equates marginal private costs to marginal private benefits. But there are public costs and there are public benefits that needs to be taken into account.

So that's one type of good we want to argue that you don't simply want to let respond to the market. You need the government involved.

Well, there is considerable evidence that the U.S. has under invested in its infrastructure.
The second type of good we call *public goods*, and that's a good that once produced cannot exclude people from consuming it. The obvious example of that is defense, national defense. Once we have national defense, somebody pays for it, and we all enjoy it. So, national defense is something that we have to do as a community, as a country. It's something that the market can't price. The other standard example of a public good is a light house; one that helps ships see their way through. Obviously you can't prevent someone from using that light house once it is in existence. So there are so called public goods in which you cannot exclude people from consuming that also require a government presence.

And finally, there is something called *increasing returns*. And this gets a little closer to home and about what I'm going to talk about today. Those are goods in which if you were to let the market price those goods, it would come up with a price that was too high. These are goods that have increasing returns to scale. Roads and bridges are a good example. That is, the price for an additional user to use the road or to use a bridge is very small or close to zero. That's the efficient price because the additional cost of using that bridge is very small and yet. Obviously, a private producer of that good, of that highway or that bridge, were to not charge a price couldn't make a profit. So if you allow those type of goods to be privatized you get much less than the efficient amount.

You have three types of goods that economists have identified that clearly need a government involvement. The last one, those increasing returns, tend to cover much of our infrastructure - although if you define infrastructure more broadly than physical things [education as well] there clearly is a need for government presence. The fact that there is a need for government presence, suggests that the government may be wrong, may not produce enough of that good. So that's how I come to the potential for shortage. For political reasons, we may not allocate enough to our roads, our bridges, our sewer systems, our schools, and again you have to tax everybody to raise funds for this type of good. It shouldn't surprise us that at times we don't raise enough money or money gets diverted and we have a shortage. So there's a conceptual argument, if you will, that even in a private market economy you can have shortages.

We have a shortage. Has the government not done its job, or has the public at large failed to give our political system enough resources to provide the type of public goods that they want? Well there is considerable evidence that the U.S. has under invested in its infrastructure. Let me point out that infrastructure is very important to economic development, both at local and national levels. Let me mention some of this evidence, some of which is fairly casual. It's just what we observe, whether it's in the Twin Cities, whether it's in New York, congested highways and airports, collapsing bridges, deteriorating roads, periodic water shortages, faulty waste disposal systems, all sort of the things we have been hearing about in the 80's. In the 80's, while our economy was growing, between 1982 and 1990 we had something like a 4% annual growth rate in this economy, we created around 19 million jobs, and yet over this period its has become

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*For Political reasons, we may not allocate enough to our roads, our bridges, our sewer systems, our schools, and again you have to tax everybody to raise funds for this type of good.*
clear that our infrastructure has suffered. National Council on Public Works Improvement, for example, in 1988 noted that public work outlays at all levels of government fell from 2.5% of GNP in 1963 to 1.2% in 1984. Again, a period of generally speaking very high growth rates in this country, and yet as a percentage of GNP the amount that we spend on capital outlays and public works declined significantly. National Council also reports that the growth in public capital stock net of depreciation fell to less than one percent per year between the late 1970's and the 1980's. So this level of our capital stock, the value of our capital stock, has been declining. The Federal Highway Administration reported that of the nation's 576,000 plus bridges, roughly 40% are either structurally deficient or functionally obsolete. The cost of repairing the bridges, just in the Federal Aid System, is $67 billion, while allocation before the 1991 bill was only $1.6 billion per year. The Federal Highway Administration also forecasts a 436% increase in urban freeway congestion by the year 2005 if improvements to interstate systems are not forthcoming. So, we have some casual impressions that we have a problem, we have some studies out there by our Federal Highway Administration that suggest that this is a real significant problem.

Academics have gotten into the phrase well, and there is a fellow by the name of David Ashower, who has published quite a bit on the importance of infrastructure capital expenditures, roads, and schools. Ashower's work suggests that there is a very strong, positive effect between public capital stock and the amount of goods and services that the economy produces. Ashower has done some formal analysis that highlight these effects. What he's done is to estimate, from what economists call the production function, is to show therefore a given amount of inputs how much output is produced. It is not just at the firm level. Ashower has done it for economy wide level. And he's done that study for the years, estimated a production function for the years 1949 through 1989. And one of the major inputs into that production was public capital. And he finds very high returns, that is, with such expenditures, with such public investments, the private sector is able to produce significantly more. Let me give you some of his specific results. He shows that output per worker is positively and significantly related to public investment capital infrastructure. He found that the rate of return on the private capital is around 9-12%, but, on public capital. These are recent numbers, are well over 100%. There is an extremely high return on public investment. In a more recent study, instead looking at the U.S. over time, Ashower went across states for the years 1965 to 1985, and found the same results. Those states that spent a significant amount of money, on their infrastructure tended to have private companies producing more goods and services. Ashower's studies have received national and international criticisms and reviews, most have been positive. But, there are some criticisms that I think make us want to re-look at Ashower's work. For example, many have pointed out that there is a reverse causality problem; that maybe strong economies can afford to invest more in their infrastructure so the causality is going from a strong economy to an infrastructure as much as its going from an infrastructure to a strong economy. Others have pointed out that these high returns on public investment just don't appear very plausible. Nevertheless, after reviewing the literature on what Ashower did and reviewing his critics, my view of it is that Ashower is essentially right. His estimates may be a little too high, but his message is one that is worth noting, and taking very
seriously. That is, infrastructure - that public investment in the capital goods - is very important for private economies and the returns are quite high. Perhaps not as high as some of his estimates, but clearly in my view anyway there is a strong case that can be made. One of the critics decided there was another way of looking at the importance of infrastructure and he also finds out that it supports Ashower's work. He looked at what he called the Revealed Preference Argument as expressed by taxpayers votes. In bond elections, where 25% of infrastructure is determined, that is where much of the infrastructure is determined at a state and local level by taxpayers bond elections, and what he did is he took a look at these votes (this is a fellow by the name of George Peterson, he's a senior fellow with the Urban Institute) he argued that if local officials attempt to design capital programs that match the median voters preference, and that's what theory suggests they should do, they should be trying to accommodate voters desires, that frequent bond proposals should be closely contested and if we find that bond proposals for capital expenditures, a large majority are voting, -- yes. If a large majority are voting "yes", it implies that we're not financing enough public infrastructure. In other words, if we are financing enough we should get to the point where voters say "That's enough." And that's going to be a close call whether it passes. He says instead we find that these things are passing by large majorities and that we haven't passed enough. If we went to the data, you looked at the years 1984 to 1989 you found that 80% of non-school infrastructure bond proposals on a value basis were approved by the public. The average approval rating on all such proposals was 66%, a rate that exceeded any other type of referendum. Again, Reveal Preference - these are close calls; we haven't pushed these bond proposals enough. They go through fairly quickly (80%). His conclusion is that we have a long way to go. Again, this is consistent with Ashower, and consistent with the general views that there is a shortage.

Those are the two types of studies that exist in the literature that I think are fairly impressive. I started out by saying that I would look to see if there could be such a shortage in a market economy and I said yes, conceptually there could be since we have these special types of goods that the market doesn't provide in the right amount. So, I said there was a potential. I went through some evidence for you, some casual evidence, some formal work done by a number of economists that support the casual evidence that we do have a shortage in our infrastructure. And Congress seems to have responded. As I started out, the President signed the bill in December of 1991 that allocated around $155 billion over six years; problem solved, we're done. Now, we leave it to most of you people to figure out a way to spend this money. But I don't really think that the problem is solved, and I'm not sure that's the right amount of money. You would probably know that better than I. But let me just mention a couple of concerns of mine, concerns that appear in the literature, that make me worry about whether we've done enough by simply just passing a bill for $155 billion.

...of the Nation's 576,000
plusbridges, roughly 40% are
eitherstructurally deficient
orfunctionally obsolete. The cost
ofrepairing the bridges, just in
theFederal Aid System, is
$67billion.
One obvious point, at least obvious to me, is that $155 billion has been authorized by Congress over six years. Now, you should know that what is authorized is often not spent. We're looking at a $368, $367 billion deficit for fiscal '92. My betting is that we will see over $400 billion in fiscal '93, and with those kinds of numbers there is going to be lots of pressures not to spend that money. I don't see the deficit problem getting any better in the near future. I think it's going to hang over this economy's head for some time. I think it's going to have an effect on this authorization. Again, you may know better about the politics than I do. But, I'm suspicious that $155 billion over six years will really be available.

Other arguments that make me concerned is the use of funds, and the use of the infrastructure that we have. The argument has been made, and I think it's a good one, that we could do a better job of using what we have. We can do more efficient pricing, for example. Let me cite a study by Sir Winston, I'm sorry, Clifford Winston, who was a senior fellow at Brookings, I should mention a number of very good studies appear in a Federal Reserve Bank of Boston Proceedings of June 1990 - that this proceedings was addressed to the question of a shortfall in the infrastructure. Winston claims that there are large benefits for making better use of our current infrastructure, one by pricing, and two by designing infrastructure more efficiently. And let me use, it seems appropriate - obviously - for this audience, a highway example. Winston claims that roughly half of the non-local roads in the U.S. are in fair or poor condition. And traffic during rush hour approaches capacity of one half of our urban interstates. His solution, instead of simply building more highways, or looking to various forms of mass transit systems, is for better designs, taxes, and pricing. He estimates if we do this at least a $20 billion will be saved annually. What does he mean? Well, first of all he talks about improving the durability of the roads by increasing their thickness. He claims there would be a significant gain from spending more money up front in the thickness of our roads. This would increase the long term wear. And he's gone through a cost/benefit analysis, and part of this $20 billion is, again, this increase in thickness.

One better design. Better taxes, he prefers and argues that we should be taxing those who put the most stress on the roads. Winston also argues for an axle weight charge rather than a gasoline tax; more of a user charge for those who are putting the most damage on the roads. Thirdly, he argues that in large cities we should be pricing congestion. Something called the automated vehicle identification,- the AVI's are working now in certain cities around the world. Hong Kong at one time had such a charge; Singapore today is using it very successfully. These are stickers that are monitored on cars, monitored automatically, so that when you drive into the inner cities downtown areas during rush hours you are automatically charged a certain amount for using prime time, if you will, and in both Singapore and in Hong Kong they have found significant benefits in terms of congestion and the amount of pollution; reducing congestion, reducing pollution by pricing for prime time hours. So, Winston's solution is that, yes, we need more money, we need more infrastructure. But, he argues that we need to use what we have more efficiently. Partly true, better building better roads; partly true, taxing users more carefully and three, pricing congestion.

There is another issue, though, that I think is very important. I have become directly involved with here in Minnesota, and that is a more general issue about preventing public funds from being used for
the type of goods and services that I've discussed, the spill over goods, the public goods, and the increasing returns to scale goods. Those are appropriate uses for government and for taxpayer's resources. But, we have to be careful that we need to prevent those funds that are earmarked for public goods from being diverted to private activities. Between 1975 and 1985 over $400 billion in state revenue bonds were issued for private activities. Now that's a very interesting statistic. It is over that period that we saw decline in the infrastructure. Congress, when they allowed individuals to deduct interest on state bonds, had no intention of having that money used for private purposes. The original intent of Congress back in the 1930's when they first started allowing this, was to have state governments use such bonding authority to build their schools and roads. This money was never intended for private use, but over time, governments realized that they could - state governments and local governments - use this bonding authority to subsidize private companies by borrowing the money from the market as a state bond then lend it as a low interest rate loan to private companies. Congress tried to stop this, but wasn't very successful. Asike I said, between 1975 and 1985, in particular, over $400 billion was used in this revenue, by issuing it in tax deductible bonds to subsidize private activities. Well, finally in 1985 Congress bit the bullet, realizing it was costing national taxpayers a considerable amount of money, and that the use of these revenue bonds to subsidize private companies wasn't creating any new jobs, they were simply moving jobs around the country. Or they were subsidies to companies that would have located in communities in which they were locating in anyway. The tax law in 1986 put a cap on the amount that states could issue in terms of revenue bonds for private activities. So that cap, I believe, is $50 per capita, or $150 million - which ever is higher. Any given state, in any given year, can issue up to $150 million in revenue bonds or $50 per capita. What's interesting, is that after 1986 much smaller revenue bonds have been issued for private purposes. But, some states, and Minnesota is an example of one, have found a loop hole around this. They haven't issued revenue bonds for private purposes. Minnesota is now issuing general obligation bonds for private purposes. Now, the distinction here is that in a revenue bond there is no taxpayer risk; the bond is backed by the revenue from the private company. With a general obligation bond, and Minnesota is doing - they're issuing bonds that if the company should default it's the taxpayers that are going to be at risk. Minnesota is issuing those bonds, for which they can get very low interest rate then they pass those on to the private company. The recent example of this is Northwest Airlines who came to the state last year and asked for a three quarter of a billion dollar loan from the state to build two maintenance facilities up in Duluth as well as to provide an operating loan. That recently passed. It avoided the cap problem because these were not revenue bonds, these were general obligation bonds. Northwest Airlines ended up with a 7% loan, and to get some idea of what the subsidy is from the state to this private company; their bonds were yielding at the time, about 24% on the market. So, there was a difference. If they had gone to the market on their own, they would have had to borrow at 24%, from the state they get 7%. The hidden subsidy here, is the difference between those two rates and the risk that the taxpayers bear if the company should go broke.

Well, some can say, -- "Fine." "The state of Minnesota may need Northwest Airlines." But, this is money under limited resources that the state may have to finance
infrastructure. We clearly have an infrastructure problem, not just in Minnesota but nation wide. And my argument is that if money is being diverted to private companies, companies which the market would take care of, there's going to be less money for infrastructure. Not only do we have to use the funds that are earmarked directly for infrastructure, for roads and schools, and bridges, more efficiently, and tax and price properly, we have to guard against the use of public money for private activities. It's been going on for many years. In Minnesota, for example, we have a constitutional amendment that actually prohibits the state from lending to private companies and yet they found a loop hole. We have to guard against this in order to make sure that our infrastructure problems and shortages that I talked about earlier, are funded over the long term. I would recommend that Congress go back and revisit that 1986 Tax Act and put a cap not just on revenue bonds, but on general obligation bonds as well.

My conclusion is that the shortage is real, it's not just a possibility. It is real - the evidence is there. Correcting the shortage should include, again, more efficient pricing, better design of existing infrastructure, and a protection of the public funds so that these funds and these resources will be used to bolster public goods and ultimately, the private economy and increase production in our economy. Thank you very much.